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FEDERAL FORESTRY

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THE part played by the nation in forestry must always be large. Here as in all other countries, the real development of forestry began when the government took up its practice. Even today some persons would leave the forests entirely to private owners; others insist that the public phases of forestry are altogether a State function and Federal activities in this field uncalled for. Those who hold this view are usually either lukewarm concerning the need for forest conservation or opposed to restricting private activities.

National responsibility in forestry is perfectly clear-cut. There need be no confusion with an equally clear-cut responsibility of the States. And as to private forestry little of value has so far been done that has not been an outcome of public action through State or Federal agencies, or both. It was the work of the Federal Government in placing its own forests under administration, its demonstration of fire protection and of conservative lumbering, its experimental and educational work, and its stimulus to our educational institutions to train and turn out a large body of foresters, which created the present wide interest in forestry and brought the efforts of other agencies into successful play. I do not mean in any way to overlook the splendid work of certain individual States like Pennsylvania and New York, which dates back many years. But that was localized in a few States. It required the nation itself to set in motion a na-

tional movement. The national work will always be the backbone of American forestry, not trenching on or interfering with State work or individual efforts but serving as a demonstration of forest management on its own lands, a center of leadership, co-operation and assistance to State and private work, a means to handle interstate problems and coordinate the work of neighboring States, a guarantee that national needs which individual States can not meet will be provided for on a national scale.

Underlying the forestry problem are two fundamental considerations which should be emphasized and reiterated until thoroughly driven home. One is the public character of forestry. The public has a peculiar interest in the benefits of forestry. Both in the matter of a continued supply of forest products and in that of the conservation of water resources the public welfare is at stake. In each case purposes vital to the prosperity of the country can be accomplished only with the direct participation of the public. Private owners will secure results only on a limited scale in the long run on their own initiative. It takes too long, 50 to 200 years, to grow a crop of timber trees. Most private owners in face of fire risk, bad tax laws, and uncertain future markets will not make the necessary investments. Most lumbermen have bought their lands either to log or to speculate in the standing timber, not to grow trees for later generations. Nor will private owners make investments for general public benefits, as in



RAINBOW FALLS, MADERA COUNTY, SIERRA NATIONAL FOREST, CALIFORNIA. "IN THE CONSERVATION OF WATER RESOURCES THE PUBLIC WELFARE IS AT STAKE."

watershed protection. If the public is to secure the benefits of forestry it must take the measures necessary to guarantee these results, and it must bear the cost of what it receives.

Closely related to the fact that forestry is in many aspects a public problem is the second of the fundamental considerations I wish to emphasize. Forestry requires stability of administrative policy and such permanence of ownership as will ensure it. Herein

lies the difficulty of private forestry on a large scale. Timberland owners are interested in the protection of their standing timber merely as insurance. Most of them are not interested in forest production, or in protecting cut-over lands if that involves substantial annual charges and is not necessary in order to protect their remaining standing timber. As yet the problem of cut-over private lands is unsolved. It is now devolving on the State to aid in their protection



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BUILDINGS ON HOMESTEAD UNDER ACT OF JUNE 11, 1906. NEAR YAMPA, ROUTT COUNTY, WHITE RIVER NATIONAL FOREST, COLORADO. "PROVISION IS MADE FOR THE ACQUISITION OF AGRICULTURAL LANDS THAT MIGHT BEST BE DEVELOPED UNDER PRIVATE OWNERSHIP, AND SUCH AREAS ARE NOW BEING CLASSIFIED AND SEGREGATED FROM THE FORESTS VERY RAPIDLY."

from fire in the interest of its own citizens. It will require the utmost resources of State and Federal Government together to handle this problem of getting reasonable protection of private forests and permanent production of timber on cut-over lands. Stability of policy and permanence of ownership are essential to any successful attack on this great conservation problem.

This principle of stability of policy of administration is a large factor in successful handling of public property and has been consistently considered in the national forest work. I am frequently asked as I travel about the country whether I am going to make important changes in the forestry policy. I was asked that very often in 1910, when I first took office. I am asked it often this year. My answer is that what we are seeking is not changes but the development of a permanent public enterprise with consistent and stable policies. The national forests were set aside in the recognition that the bulk of these lands should be handled permanently under public protection and control. Provision was made for the acquisition of agricultural lands that might best be developed under private ownership, and such areas are now being classified and segregated from the forests very rapidly. The successful handling of the national forests requires annual expenditures in administration and protection and in development of roads, trails, telephones, buildings, and other improvements necessary for proper administration. We seek, therefore, as fast as possible to develop through classification the permanent boundaries of the forest land, and the management of it according to definite far-sighted plans that will make for the best results of all expenditures in the long run. The result sought is an efficient business administration, a proper and adequate forestry practice, and development of the public property in the interests of the people who own it. These simple principles have been kept in mind since the first organization of the work by Mr. Pinchot, who was more than any other one man re-

sponsible for what has been accomplished in forestry in this country.

The national forests have now been under administration fifteen years, and under the Forest Service for eight years. The aim of the present administration is not to overturn, but to take every possible step to increase efficiency of the organization, to adjust difficulties, and advance as fast as possi-



FOREST RANGER RYAN REPAIRING TELEPHONE LINE, ESTES PARK DISTRICT, COLORADO NATIONAL FOREST, LARIMER COUNTY, COLORADO. "EACH YEAR'S WORK ADDS 3,500 MILES OF TELEPHONES."

ble the purposes for which the national forests were established. Secretary Houston recently said to me regarding the national forests:

"Establish permanent boundaries. Classify your lands; segregate the agricultural land and fix right limits for what is needed as protective and productive forests. Develop permanent policies based on full recognition of



A CUT IN A SNOWDRIFT OVER THE RILEY ROAD. SHOWING WHAT WORK IS REQUIRED TO REACH THE MILL IN SPRING. SUPERVISOR BLAIR IN WAGON. GARFIELD COUNTY, WHITE RIVER NATIONAL FOREST, COLORADO. "MAKE EACH FOREST WORK FOR COMMUNITY UPBUILDING AND LOCAL AS WELL AS GENERAL WELFARE. WE MUST ALWAYS HAVE IN MIND THE MEN AND WOMEN WHO ARE BUILDING UP A NEW COUNTRY."

lasting public interests, and settled forestry practice fitted to the individual needs of each forest and locality. Study efficiency; make any changes necessary for this purpose, but make no changes that are not clearly called for in the public interest. Carry out your plans for the development and increasing use of the forests; but above all, make each forest work for community upbuilding and local as well as general welfare. We must always have in mind the men and women who are building up a new country and laying the foundations for prosperous, thriving commonwealths. We must try to study their needs and see where and how the forests can help them. But we must not cease to guard effectively against the evils of private privilege and monopolistic control of resources now the property of the public."

The first important result of national forestry is a demonstration that the forests can be protected from fire. It was only a few years ago that many asserted this to be impossible. In the Northwest the smoke season was as inevitable as the rainy season of winter, and this was not merely the result of clearing land but from forest fires. It is only recently that our own forest officers have regarded lookout stations as feasible in certain places; for lookout stations are useless if smoke hides the view. This year has been the worst in many respects of all years in California because of the frequency of lightning fires. Yet the lookout stations on only two forests, and then only for a short time, were out of commission because of smoke; and the smoke came from fires on private lands. This year in California there were over 1,100 fires on the timbered areas. These were kept down to an average of a little over 20 acres per fire. This was done by an effective fire organization and through the means of the trails, telephones, and lookout system. In one storm lightning set over 20 fires on one forest. It takes swift and efficient work to handle such a situation. The results so far attained show that fires can be mastered. But it is necessary first to put the forest in a condition to

enable the force to prevent fires, to detect those which start promptly, and to reach them quickly. The Forest Service is developing a system of lookout stations, fire lines, trails, and telephone lines that ultimately will make the forests secure. Already the force is able to save every year property valued at many million dollars through the improvements so far built, although as yet only a beginning has been made. This work is carried on according to a definite plan, already projected in detail. Each year's work adds 2,500 miles of trails, 3,500 miles of telephones, and many lookouts and other improvements, progressing toward the final scheme. Until that is completed the forests can not be made entirely secure. With that development, the forest fires can be handled even in that exceptionally dry year that occasionally comes to every region.

This protection not only saves the trees from destruction or injury, but already the effect is shown in the restocking of many areas where the old fires had prevented reproduction. Personally, I had hardly expected that there would be so quick a response. But the results are now apparent to even a casual observer. More specifically, while previously the forests were going backward because of fires, there is now an annual gain through growth. This increase translated into dollars and cents is much greater than the total cost of protection and all other expenses of the forests.

The necessity to take immediate steps to prevent the public forests from being destroyed by fire has placed a large emphasis on the protective feature of the administration. The wise use of the forest resources in the development of industries and in building up the country is essentially the real aim of maintaining the forests. Protection from destruction is a first essential; otherwise there would be no resources to use. But the purpose of the administration is not merely protective, but constructive. It is a favorite theme of the opponents of the national forest system to represent the forests as a separate Federal domain, held for the



DIVISION DAM CONSTRUCTED AND USED BY THE UNITED HYDRO-ELECTRIC COMPANY IN POWER DEVELOPMENT. GEORGETOWN, CLEAR CREEK COUNTY, PIKE NATIONAL FOREST, COLORADO. "THE WISE USE OF THE FOREST RESOURCES IN THE DEVELOPMENT OF INDUSTRIES AND IN BUILDING UP THE COUNTRY IS ESSENTIALLY THE REAL AIM OF MAINTAINING THE FORESTS."



COUNTING SHEEP AT COUNTING PENS, RANGER STATION, MONTEZUMA NATIONAL FOREST, COLORADO. "THE AIM IS TO MAKE THE FORESTS COUNT IN THE HIGHEST POSSIBLE MEASURE IN THE INDUSTRIAL UPBUILDING OF THE LOCAL COMMUNITIES."

use of future generations or for persons other than those now living in the region in which the forests are situated. Such statements are not only contrary to the spirit of the administration of the forests, but are disproved by the results already being secured. The aim is to make the forests count in the highest possible measure in the industrial upbuilding of the local communities, at the same time that they serve their broader public functions. In classifying the agricultural lands the aim is to get people to make permanent homes in the forests. Every consideration in the development of the States and in the upbuilding of the forests themselves makes for the encouragement of a greater local population. When there are people to create a demand for the timber and other resources, the real development of the

forest becomes possible, and the forest begins to render its greatest service.

To encourage this development the Forest Service is promoting the sale of its ripe timber to build up local lumber industries of a permanent character; it is opening to entry land chiefly adapted to agriculture; it is further helping the settler by providing free such timber as he needs and protecting him in the use of the range needed for his stock; and in every way it undertakes to make the forests of public service and the country in the long run a better place for men and women to live in.

That a long step has already been taken toward this end is indicated by the very extraordinary change in sentiment in the West in the last few years. I have this year been able to analyze in detail the sentiment on the individual forests and now know just where oppo-



TRAIL CONSTRUCTED BY FOREST SERVICE AT A COST OF \$35 PER MILE. WEST SIDE OF MASSANUTTEN MOUNTAIN, VIRGINIA. "THE ACTUAL SAVING FROM LOSS ON AREAS PROTECTED FROM FIRE DIRECTLY AS A RESULT OF THE WEEKS LAW, WOULD AMOUNT TO A VERY LARGE AGGREGATE SUM."

sition in each case exists and the extent to which the work of the Federal Government is valued. I have been astonished at the overwhelming preponderance of sentiment among the local communities in favor of the forest system. Frequently there are objections to certain regulations, or difficulty and friction in specific transactions. But every year these local troubles are being adjusted on the ground. There is still definite opposition to the forest system and the principles of our administration from certain groups, and

certain interests. There are still certain water power interests which are carrying on a fight against the Forest Service. Many speculative interests oppose the forest system because the resources are not open to private acquisition under the general land laws. Certain men are opposed to the national forests because they can not secure privileges that would be possible if the forests were unprotected. For example, in the Southwest I find a well-defined opposition among those who desire to run herds of goats on the forests with-

out restriction. The desire to secure valuable timber for speculation is now, and always will be, a source of opposition to the public control of our forests.

One proof of the present favorable sentiment is the fact that there are now relatively few breaches of the regulations. For example, in the Fourth Administrative District, which includes Utah, Nevada, northern Arizona, southern Idaho and southwestern Wyoming, over 11,000 permits were issued last year, each involving some regulation. There were only 35 cases of trespass, about half of which were innocent and the majority of the remainder not very important. Such a record would be absolutely impossible if the people themselves were not right behind the regulations. In other words, it was public sentiment that made it possible to carry out the procedure with such success.

In the national forest districts it is now seen that the aim is to make the national forests serviceable at present as well as in the future, and people are co-operating more and more with the Government to make the local administration successful.

In the East the work of the Federal Government is today far more effective than ever before. The establishment of national forests under the provisions of the Weeks law is accomplishing many results not anticipated even by its most earnest advocates. The purchase of lands on important watersheds in the White Mountains and southern Ap-

palachians is steadily progressing. Already contracts for over 700,000 acres have been approved by the National Forest Reservation Commission. These lands are located on the most important watersheds and have been secured at prices representing their actual value, the average being \$5.07 per acre. It has already been demonstrated that the building up of national forests by purchase and at reasonable prices is practicable.

The first effect of these purchases has been an educational one. The wide interest in the work has resulted in an awakened appreciation of forest protection and forestry wherever the Government has been examining land for purchase. Co-operation in forestry between the Government and the States has received a great stimulus. The actual annual saving from loss on areas protected from fire directly as a result of the Weeks law, on private as well as public property, would amount to a very large aggregate sum. In short, the Weeks law is now yielding results which fully justify the new policy which it established.

The nation's interest in the success of the forestry movement is very great; the contribution of the nation through Federal agencies should be correspondingly liberal. Let the Federal Government assume its full responsibilities of leadership, assistance, and co-operation, and our forest problem will be on the way to certain solution.

* An address at the Fifth National Conservation Congress.

The Panama Canal Commission has requested the Forest Service to inspect the timber being creosoted at Seattle and Tacoma for the commission.

The net receipts from the national forests of Washington and Oregon during the past four months amounted to \$115,620, an increase of 17 per cent over receipts for the same period last year.

Of the two million trees to be planted on the national forests of Montana and northern Idaho during the present fiscal year, one-half have been set out this fall and the rest will be put in next spring.

A thoroughly up-to-date sawmill with a capacity of 60,000 board feet a day has been erected, on the south coast of Mindanao Island. It is of American make throughout, and uses the modern bandsaw. This is only one of several such mills in the Philippines.

FIGHTING FOREST FIRES

By E. R. BRUNKE

[In this story Mr. Brunke tells about what he terms the Class C fire, one of unlimited area, which creeping, sweeping, consuming, leaves nothing but desolation.—EDITOR.]

WHEN Pete Smith climbed into the cab, he cursed, loudly, plainly, vociferously. Forty-two was five hours late. Also, she was in the sulks. Something was the matter with her. It wasn't plain to Pete just what that something was, or else the heat was affecting them both. He had gone all over the engine a dozen times without results, and finally decided she was just acting "ornery."

So they panted and wheezed and groaned up the grade, the long string of freights behind creaking and rattling and pounding, and though the big engine was apparently doing its best, they couldn't seem to make up that lost time.

Maybe it was the heat; it certainly was hot. There was heat depicted everywhere. The shining rails dazzled in heat. Quivering waves of heat rose from the roadbed, and all along the grass was gray and brown and stiff and parched. There was a haze of smoke in the air, and always that dull vampid quiet of a hot summer day. Section gangs, grateful for the interruption, ceased their work to watch with lifeless interest the long train roll by. They were performing their labors as if in half a stupor. They, too, felt the heat.

The engineer leaned against the cab window and mopped his brow. After a moment he glanced over toward his fireman. The man was staring listlessly through the open window, still panting heavily from his last efforts. Once in a while he'd mop the grimy sweat that rolled continually down his face, but he said nothing—it was too hot to talk.

Also, it was too much for Pete Smith not to talk.

"Tony," he yelled across at the fireman. The latter turned his head slowly and a grotesque grin spread over his features. "Tony," said Smith

again, "it's hotter 'n blue blazes. Eh, what? Yer damn right, it's hot," he finished, in answer to his own question. He went to mopping again.

Tony swabbed his arm over his face—it didn't seem to do much good except to paint anew the greasy smears.

"Hotter'n forty-seven kinds of hereafters," he muttered. "It jes natcherly couldn't be no hotter. Why, even 'She' feels it—the ol' gal's actin' like a broken-down plow horse. It sure is hot, all right, all right."

That mutual understanding settled the conversation for a while. Anyway, it was necessary for a breathing spell between words.

Suddenly Smith looked over at the fireman.

"Tony," he yelled, "I got it, I got it. It's that blamed spark arrester, that's what it is. It's chokin' her back so she can't breathe. I tell yuh, Tony, take that bar an' go out an' jam hell out o' that screen—no ladylike job, neither."

Tony raised his brows. "You know th' rules, Pete. Somebody's liable t' git fired, aint they?"

The engineer stopped mopping. "Well, them rules ain't runnin' this string o' cars nor makin' up them five hours, are they? Go on, now, Tony, an' I'll take th' blame. We gotta do somethin', rules or no rules.

He slowed down while Tony took the bar and climbed out over the engine. As for Tony, why he'd just about as soon have jammed a hole in the side of the boiler for all he cared. "Why," he was saying to himself, "why, for instance, didn't they make rules so's the engineer and fireman could have some nice, cold ice water on tap in the cab. Look at all them clerks in the railroad's big offices back in the city doin' nothin' but sittin' at desks under 'lectric fans, wearin'



THEY WERE STEEP SLOPES—THOSE.

starched shirts, an' drinkin' ice water. Some soft job, that." (Maybe—and yet there were a number, a very large number, of those self-same clerks who would have differed with him materially as to the softness of it).

Still, Tony didn't let that bother him. He followed the instructions of his immediate superior explicitly. He really did a very fine job, judging by the number of holes he jammed in the screen. In fact, as a screen it's purpose was made decidedly nil when he was finished with the work and had gone back into the cab.

Yes, old forty-two certainly breathed easier after that; she was even picking up a little speed. As if to show her reinvigoration she cleared her throat of sparks, spat them out everywhere and continuously—high into the air—to one side—to the other side. Through the deep cuts where the top of the stack was but a few feet from the edge of the bank she kept throwing sparks profusely. What cared she that some of them found a ready landing place, a sort of feed bed in the dry grass, long before they had died out. Her sole business was to make up time.

They were steep slopes, those, where

they didn't wait for the winds to come but formed their own draught to feed and nurse the tiny sparks into roaring flames, and soon a dozen fires and more were strung along in the wake of the passing engine.

Sure, old forty-two made up half an hour, and Pete Smith, forgetful of the heat, was happy when he reached the end of his division. But he didn't know that for twenty miles behind him he had scattered fire along the line—that a hundred men and more of his own company were fighting the flames to hold them out of the timber, and that the many holes he had ordered jammed in the spark arrester were but the foundation for a deplorable devastation to follow. There was a lot Pete Smith didn't know just then. And there was a lot he was yet to learn. "For," he had said to himself, "he was only an engineer, and his business was to run his train on time. Let the Forest Rangers look after the forests and put out the fires—that was their business."

Now, it happened that the superintendent of that division was a young man, an active man, a progressive man. He heard about the fires along that line, so he went and investigated for him-



FOR TWENTY-TWO MILES FORTY-TWO HAD SCATTERED FIRE ALONG THE LINE.

self. He wasn't taking anybody's word for anything just then. Ever since the cooperation between the Government and his company he was learning a lot about the forests and the fires—learning things he had never thought of or had passed lightly over as having no particular bearing on his own daily work. But one day the vice-president had accompanied him on a trip of inspection, and then it was that his eyes were first opened on to a new field. It was where a little fire was burning alongside the grade. And it was the V. P. who had first noticed it. Quickly he had ordered the nearest section gang to drop everything and put out the fire before it spread any further. And they did it.

He turned to the superintendent who had watched the proceedings with considerable interest and some amusement.

"We don't want any fires along this line," said the V. P., "we don't want any kind, large ones or small ones. We are getting out orders now that all fires starting along the right of way which seem to emanate from the railroad are to be promptly put out by them. You will get your orders direct from me, and I will personally expect you to see that every man under your

supervision understands and obeys them. Particularly instruct the section foremen to keep their eyes open because they will be the men on the ground and can stop the fires while they are still small and in the incipient stage. It's the small fires that make large ones, you know.

"You see," he went on, "we own a lot of timberland along this line, and for several miles adjacent. We own it in fee, and it's a very valuable asset of this company. Not only is it an asset, but an asset that is appreciating in value just as surely as our other assets are depreciating. All we've got to do is to protect it from fire, and if we can do this successfully there is absolutely no question but what some day we will realize a fine return. We want a lot of the timber ourselves, for maintenance, for ties, for bridge timbers, for cribbing, piling, poles, and a dozen and one other things—you know yourself that the demand for this class of timber is becoming more acute every day—and by putting a large part of our timberland under the charge of an expert forester we hope to maintain a supply to meet our needs for all time. For the present, however, our efforts

must be largely in the matter of protection.

"And then take all this other timber you can see, which is owned by private parties and the Government. It will all be logged some day—in fact, a large part of it within the next five years. That means tonnage for us, and tonnage, you know, means dollars and cents. They say the logs can't be driven down the creek, so we'll get the hauling of both logs and manufactured lumber. We want both, and we want all we can get. If the standing timber is all burned off we get nothing, and have nothing left but a desolate, uninteresting country through which to convey our tourists. As it is, it is a beautiful country, and we want to keep it so, not merely for this year, or for next year, but for always.

"Last week we signed an agreement with the Government to cooperate in the matter of fire protection. We are paying for certain patrolmen, offering the services of our laborers when necessary, putting forest fire warnings in our time tables and advertising literature. And in a number of other ways lending our aid along that line. All engines are to be equipped with spark

arresters. Another season we expect to have oil burning locomotives and maybe in a few years the entire line through this section will be electrified—we're hoping so and planning for it.

"You see, I'm telling you these things so that you may feel the policy of our company, which is nothing but a common sense policy after all though one in which we begin to take a good deal of pride, and I want you to think of all of these things in a broad way and direct your work accordingly. You may be sure of the hearty backing of your superiors."

All of this conversation was flashing through the division superintendent's head as he sped along in the wake of forty-two. The excitement of the thing began to get in his veins. The smell of smoke was going to his brain. It touched his most latent activity and roused within him an earnest desire to do his part and to do it well. There was always so much satisfaction to him in doing a thing well.

Everywhere he pulled the men off the grade and set them to work putting out the fires, instructing them how to make their trenches, and of the importance of watching, watching, watch-



HE PULLED THE MEN OFF THE GRADE AND SET THEM TO WORK PUTTING OUT THE FIRES.

ing, until every remaining vestige of the fires was gone.

It was a big job—there were a lot of fires and they spread rapidly over the dry ground, and because of it all he was doubly anxious to make a showing—to hold the fires out of the timber.

So he worked all day and into the night, taking no time for meals or sleep, always obsessed with the one thought—to hold the fires out of the timber at any cost. He liked the thought of that expression—it harkened him back to his own college days on the gridiron—



THE SECTION FOREMEN ARE THE MEN ON THE GROUND.

that swelling, cheering, maddening, appealing cry, "hold them, hold them, hold them."

But now there was no yell to spur him on, nothing but an indomitable will to know that he could do that which was expected of him, that which must be done, that which spelled success.

And so, all through the night he drove his men along that twenty miles of line, kept them working on the scattered fires, moving them from place to place, maneuvering, urging, ordering. Himself he had quite forgotten.

Yes, he accomplished something, and when morning came he turned in dead tired, blackened and sweaty with the smoke and toil, but peaceful in mind. All fires were surrounded *outside of the timber*, and if the wind would but hold off or the rain would come no damage would be done. Yes, he had held them, and so he earned his needed sleep.

But, ah, there was another lesson in the bitter school of experience ahead for this young man—an appalling, crushing, vivid example of the terrible will of the elements. For, he was yet to learn the power of the wind—aye, the wind, the wind, only the wind, but such a fiend incarnate.

* * *

Sam Brown gazed out of his door with some satisfaction. It would be a fine day, as sultry, hazy, smoke-filled days go. Birds were singing, insects droning and from off down the meadow came the soothing lowing of cattle. The sun, a dull red ball half-obscured by a veil of smoke, rose slowly higher, warmer and the day bade fair to be one of those listless summer days, except that it would be very hot—there wasn't a breath of air stirring even at that early hour. Maybe a little later in the day a cooling breeze would spring up to make easier the heated work of the toilers in the fields—it would certainly be grateful.

"I simply got to go to town today, Jennie," said Sam, turning to his wife, who had joined him at the door. I want to make my proof at the land office, get some medicine for the old mare and shoes for Tony (his saddle horse). An' yuh know we're about out o' flour an' bacon an' some other things (tobacco, for instance, was uppermost in his mind though he didn't say so). Think I'll pull out right after breakfast an' be back tomorrow night. What say?"

"Well, Ol' Man, you got t' do them things, all right, so I guess you'd better go an' have it over with," she responded. "What's that, Jim Gordon burning brush again?" she asked, pointing to some smoke hanging thickly in the valley to the south of them.

"Yas, I passed by there yestiday. Jim an' th' boys is clearin' up that wil-low bottom. It's real damp in there, yuh know, so th' fire can't spread. Was thinkin' o' burnin' that acre at th' end o' th' field today myself. Oughter be done before th' rains come, yuh know. An' there ain't no wind today. What do yuh say, gal, kin Johnnie an' you look after it while I'm away?"

"That's so, it sure ought t' be burnt an' I guess me an' Johnnie kin burn it all right," she answered, "but you ain't got no permit and th' warden'll likely

permits. If they keep on a man'll have t' have a permit to live."

Sam Brown went to town, and Mrs. Brown and Johnnie burned the acre. It sure burned fine, being so dry, and the flames cracked and whipped and went straight up. There was no wind. They were certainly fortunate in having chosen such a day. So they burned the acre.

Now, Mrs. Brown didn't go out in the field in the afternoon as she had fully expected to. The baby was teething and was fretful from the heat. And Johnnie went off somewhere on Jumbo Mountain looking for the roan cow that had got through the fence. So the fire burned by itself all afternoon, and, somehow, failed most decidedly to burn itself out. Instead, it deliberately overstepped its bounds—acted real arbitrary by spreading over two acres instead of only one, and still it kept trying to reach further and further. If only the wind would come and give it a helping hand. "Wind, oh wind," the flames kept calling.

* * *

In town Sam Brown made his proof, after which he bought his groceries (and things) and packed them in the wagon. He would pull out first thing in the morning, but before that he might step over and have a little drink or two with the boys—he didn't get to town very often.

He did that thing—had a drink or two, and a few more—didn't get intoxicated, mind you, just imbibed a friendly little quantity.

And always and everywhere the general topic was the dryness of things and fires. A rancher over on Cow Creek had been burned out. The Clear Creek Lumber Company had lost a section or two up in 48-3, near Twin Lakes. There were fires all along the railroad, under control, they said, but still burning, nevertheless. The papers had it that Three Forks down in Stover County had been wiped out. All through the west of them were fires. Fire, fire, fire, everywhere.

And so a dull haze had settled and enveloped everything, hanging like a pall over the town, while men prayed



SAM BROWN-----AND JENNIE.

be around. We don't want no trouble with th' law, Sam. It's th' closed season, ain't it? An' there's lots o' fire around somewhere 'pears like from th' smoke. You don't know what might happen if th' wind blows up. But if yuh say so, we kin take a chance on it—that ought t' make good potatoe ground next year."

"Oh, bother th' warden. I dunno, maybe it still is the closed season, but we got to burn while it's dry. You go ahead an' I'll git th' permit when I'm in town. These fire rangers is gittin' altogether too fussy with their rules an'



SAM BROWN WENT TO TOWN.

there would be no wind to fan into new life the dozens of smouldering blazes. If only the rain would come; there hadn't been a drop for six weeks. But only the deathly quiet of the hot summer day clung through the afternoon.

At 4 o'clock the barkeeper lighted his lamp on account of the thickening haze. As he raised the lamp chimney, his first match puffed suddenly out. Something seemed to slam outside and fall clattering. A window shade began tearing at its fastenings. The outside door closed with a terrific bang.

The man looked up, half fearful, prone to believe what had flashed through his mind. Good God, was it the wind that had come? Yes, it was the wind, the wind—not the rain.

It struck Sam Brown suddenly that a gale was coming. Supposing it reached his place. It would sweep his acre of burning slash into a sea of hell with one whisk—and maybe it would get Jennie and Johnnie and the baby. The very thought of it cleared his mind for action.

He sprang to the door and stepped out into the air. A swirling eddy of dust swept up and struck him full in

the face. There was a moaning, swishing, creaking sound in the trees as they bent before the wind, and the pall of smoke settled thicker and thicker and smelled fresher and fresher.

Over to the north a glow sprang up. He looked to the east—it was the same. To the south—to the west—everywhere. Red glows lighting and dying and springing up anew and always moving with the force of the wind. There were dull glows, bright glows, far away glows, glows around the very edge of the town.

Men swept by him with shovels and tools. He caught a glimpse of a ranger on a sweating horse, his face set and grim, calling out orders even as he rode.

Of a sudden he bethought him of the phone and hurried over to the store. Already there, waiting with strained looks to get but a chance to use that God given little instrument that would put them in communication with their loved ones, were a dozen other men. And with his ear glued to the receiver was the storekeeper ringing, ringing, ringing, and listening with his very soul; and with him listened, fearful and deathly quiet, a dozen pairs of anxious ears.



THREE FORKS HAD BEEN WIPED OUT.

The man at the phone tried them all, the different calls along the line, tried them slowly, tried them frantically, tried continuously, and with the passing moments there crept into his heart the one thought he had been striving so hard to fight off—the thought of the line being down and all communication cut off. Finally, he turned to the crowd.

"Boys," he whispered, "I can't get nobody—they don't answer, nobody at all. It begins to look"—his voice was choking with the thought of what he must say, "it looks a leetle as if th' line must be down. My God! But maybe it ain't as bad as that," he appealed, "it don't seem as if she'd travel as fast as that, does it?" Quite mechanically he was ringing again.

"I say, boys, if you need anything, shovels or grub or anything I got here, just help yourself." He turned once more to the phone and started ringing again, but now there was a noticeable hopelessness in his efforts.

For a moment Sam Brown stood appalled with the suddenness of it all—he had not quite grasped it yet; it seemed untrue, unreal, unnatural. Then he turned and sped across to the

stable. In half darkness he fumbled the harness on to his nervous team, half praying, half cursing, half crying to himself, and with the buckling of the last strap he turned them on to the road.

Ahead, over toward his home a big glare hung. It didn't flicker, it didn't quiver, just kept growing a little brighter, a little plainer.

He lashed his horses into a gallop, almost unconscious of what he was doing. The goods in the rear of the wagon he had quite forgotten, so, while they pounded around and out of the wagon he knew not or cared.

To cover those fifteen miles before that hellish glare would reach his all in life was only in his mind. That possibly he could not do it never even occurred to him. That he must do it he knew.

For five miles he went at killing speed—and then he pulled in. The horses could never stand that pace—he knew that much. And always the glare was redder and the smoke was thicker, and the smell grew stronger, flaunting his very eyes. The thought and sight of it maddened him, and again he drove the horses to their frightful gait.

Once they pounded across a bridge with a hollow, roaring clatter, and one of the horses stumbled to his knees, but the man scarce knew nor heard—and the plucky animal gained its footing again.

A four-horse team pulling a light wagon swept past him, almost phantom-like, headed for town. It seemed to be full of men and women and children. There were a lot more teams followed, and always they were going away from the fire, away, away, away from it all—any place. Sometimes they seemed to be yelling something at him, and once a woman screamed—but he didn't stop, and if he heard he gave no notice.

Once, later on, he slowed down at a steep hill, as if realizing he must begin to save the horses. Already they were showing the effects of their terrible run. They were trembling, faltering, stumbling, groaning, but always hearing the voice of their pleading driver.

Out of the darkness a man on horseback swept, his horse fairly reeking with sweat and foam. Seeing the team, he stopped and yelled something at the man on the wagon, but though the latter turned his head, he made no effort to halt his progress.

As in a maze the horseman watched the other pass on, and then, as if first grasping the realness of it, he turned his mount and crowding up the team's head, he grasped the lines of the nearest horse and brought him to a stop.

"Are you crazy, man?" he screamed at Brown. The latter looked down at him dully.

"Leggo," he said, "I got to git home. Can't yuh see th' fire's aggittin' up my way—mebbe its there now. God A' mighty. Leggo them lines, I tell yuh."

Still the horseman clung to the reins. "I'm a State fire warden," he said. "I jes' come from there"—he pointed ahead—"an' its burning all over—there ain't no place ain't a-burnin' It's hell itself. Why, it's even comin' this way—can't yuh hear it—listen."

Aye, they heard it—it was coming, all right, coming steadily, eagerly, quickly, surely, a-roaring and crashing. The very sound of it seemed to rouse anew Brown's passion.

"Leggo them lines," he yelled once more, "leggo, I tell yuh, or I'll—I'll—I'll—" His passion seemed to choke his voice.

Of a sudden, he shook out the lines and took up his whip. For just a moment he waited for the warden to release the horses heads, and then, as the latter clung even tighter, he swung the whip cruelly across the warden's face. At the sting of the lash, the warden dropped the lines and pressed his hands to his face, while half a cry escaped him—and then, quite mechanically, he groped again for the team's head.

"Man," he begged, "don't go—don't go. The bridge acrost th' Sandy's gone. You can't get nowheres. Man—man—"

The wagon swept past him, seeming almost phantom-like, and drooping in his saddle he watched it in half a stupor. He had a vague recollection of seeing a man standing on a swaying, pitching, rattling wagon, watched them pass into the wilderness to sure death, listened to the ever fainter growing curses and yells of the man urging his faltering team—and then they were gone.

* * *

They said the rain would probably come from the North.

Shorty Long, Deputy Forest Supervisor, sitting on the highest point of Old Round Top in the hottest part of a hot day, didn't believe what they said, didn't believe that the rain ever would come; in fact, he began to have some doubts as to there being such a thing as rain. It seemed so long ago since such an extraordinary event as rain had occurred that he began to seriously question the fact that it had ever rained since he had been on earth—at least he was reasonably sure that it had never rained in that particular section of the country, where things were dry as tinder and burning everywhere.

There was, however, one thing of which he was absolutely certain, and that was the simple fact that the wind was always blowing, sometimes hard, sometimes not so hard, but always blowing nevertheless. It was even blowing at that particular moment and though

its feeling was cooling to his face, some more or less unprintable thoughts of it passed through his mind.

Because wind and fire go ever arm in arm, are bosom friends, one planning, leading, driving, feeding—the other executing, killing, devouring; and together in their grasping greed they work havoc and desolation where was peace and beauty, sniting the green things and often the living beings, and sometimes in their strength fearing naught save the rains.

Hence some of Shorty Long's unpleasant thoughts.

As he sat looking off across the ragged lines of mountains that ceased only with their dwindling into space, there came to him faintly from time to time the sharp metallic ring of a shovel striking a rock and the peck, peck, peck of axes. Well he knew it to be his own men working on the fire line down below him, cutting through a bunch of dead and down stuff to intercept the fire, and digging into the moist mineral soil.

It was the end of the seventh week since he had left the office to take charge of a small fire over on Lost Creek. Followed a series of fires,

scattered and different, some easy of surrounding, some more difficult. He remembered particularly how jubilant he had felt on a Friday some three weeks previous, when late in the afternoon he had gone over his last fire and found it well under trench and in good shape, for, with the trenching of this fire things would be a little easier for him and watching only would be necessary for the dozen scattered fires they'd had to fight, varying all the way from ten to a thousand acres and more in area. But still, they'd have to watch, watch, watch always, on constant guard against the wind that might come at any moment.

So, as his thoughts reverted back again to that fatal Friday, a somewhat sardonic smile spread over Shorty Long's bristly face.

It was up on Quartz Creek where he had been looking over the trenching of a forty-acre fire. He had found things in good shape, and with a few parting instructions to the ranger in charge, a capable and willing worker, he had started down the trail that led to home. Toward evening he had felt the wind come up, though its real force was not apparent in the heavy timber. But,



SEVEN MILES ACROSS TO JOE'S STATION.

still, he wondered at the thickening haze creeping on, growing denser with the passing moments, until so thick it grew that he questioned if it might not be a fog.

Just at evening he crossed the river and drew up on the other side. It was open there and as he looked around the sight before him chilled his heart for the moment by its suddenness and its appalling nature.

Over to the west of him, where the sun should set, was another red, a brighter red, a fearful red, the vivid glare of a great fire. High into the sky it went, and slowly, yet not so slowly either, it was moving steadily onward.

He could not see the flames because the fire was then too far away, and hidden partly by a high divide, nor could he even hear its roar, but onto his shoulders and all about him there fell a steady rain of ashes, as softly as the snow itself.



HE HAD REACHED THE WEST BRANCH RANGER STATION.

A feeling of awe crept over him as, fascinated by the sight, he just stood watching and wondering. He saw that the fire was moving north, and yet he knew that the fickleness of the wind could turn its head so quickly and so surely in any direction whatsoever its whim should dictate, that its present movement would seem but a mockery, a maneuver to raise false hopes, and then in triumph would it turn and lick up, like the evil monster it was, all the green and living things it seemed at first to spare.

But to Shorty Long the sight was not one for mere conjecture. It meant vastly more to him. It meant work—good, hard work, and lots of it. Not that Shorty Long was afraid of work, small and bowlegged as he was. Far be it from such thoughts. But rather, he was pondering seriously with what success he could combat such uneven odds.

Upon him as field officer in charge must fall the full responsibility, and it was a heavy responsibility, with lives and homes and thousands of dollars' worth of property at stake. It was a man-sized job cut out for him, with full measure, and he knew it, and that he needs must resurrect prematurely the latent maturity of man in him to meet the task.

So, he wondered just how big it was, just where it was and just how it was, because he must know all those things before he could plan his action with any sort of definiteness.

Acting quickly, however, he mounted his horse and rode through the inky night, his mind ever full of flashing thoughts. Sometime later, he scarce knew just when, he reached his destination, the West Branch Ranger Station. Here he found a phone, and talking seven miles across to Joe, in charge of District 2, he learned about the fire.

"A ten-mile front it had, and was traveling fast," Joe said. Already many of the ranchers were burying their goods and moving out. If only it would slacken after it crossed the ridge and began its downward course, but mostly, if the wind would only drop, he, Joe, would start right in against it. The White Pine Lumber Company had placed at his disposal every man in their three camps, something over a hundred. This would be a most excellent start.

They could use three times that many men, Joe told Shorty—must have them—Lordy, ten times as many if they could get them. Only get them at any cost.

So Shorty called up town and gave his orders—men, men, men, and tools, was his cry. As many as they could get, only keep them coming, in ones or



EVERYWHERE WAS THE SIGHT OF BURNED TIMBER AND UNDERBRUSH AND FOREST LITTER.

twos or dozens—they could use them all.

Now Shorty Long knew that above all things he must not lose his head, so he talked with Joe and urged him mostly to keep a cool and clear head. He called up town and ordered men and tools and grub and blankets. He called a dozen homes along the line and tried to reassure them as best he could. Finally, he called up the supervisor's office and told him of it all and what he wanted, but to his consternation found that they already had their hands full there. Up in the north end, where trails were few and bad, and the country rough, a great fire had spread until its proportions were unknown. Steadily, for five miles it had driven a ranger and his crew before it, until the wind had turned and changed its course. Again it was men that was wanted above all—men and tools.

And all through the night Shorty listened at the phone, hearing rumors and reports, some true, some grossly exaggerated, but always he knew that things were bad. So just at break of day he saddled up again and rode hard across the trail to Joe's station. Joe, himself,

was already up, and together they went over their plan of action. But it was only when the day had fully dawned that he saw the long irregular lines of smoke rolling up along the ridge for miles—and again he wondered how it all would end.

So, they started with the crews from the lumber camps, split them into gangs and appointed foremen over each, and sent them out against the fire immediately after breakfast—it meant a great deal to get an early start. Everybody realized that fact thoroughly.

All through the day Shorty and Joe were on the jump, starting up where necessary other camps to save a long walk to and from the fire, looking after the new men being sent out from town, talking, ordering, reassuring, and always bringing their personal efforts to bear. At times they went right on the line to see how things were going, giving a word of command, or suggestion, or compliment here and there, but mostly just watching and planning results, because Shorty believed in setting forth his general plan in mind and leaving the details to his foremen when he saw they knew and were glad to show

what they could do when given half a chance. Because they were older men, experienced men, men with good hard-headed common sense, and only those did he try to choose, and he could not himself be bothered with too much detail—he had bigger things at stake.

As time passed and things began to run a little smooth, it seemed to him as he imagined war might be. For they were surely driving men against an intruder, an implacable enemy, a merciless foe, and the fight was always in the face of overwhelming odds, the will of the elements. Then, too, there was the other side, looking after the men and tools and commissary supplies, or caring for an injured man here and there; and always aiming to maintain order and discipline and enthusing the men as best they could in their toil and strife against the flames.

And wrapped in these thoughts he scarce heard or saw great trees bending most double before him, or crashing loudly to the ground about him. He was still watching those clouds, would watch them until every one was come and gone, and then only would he be satisfied.

Wonderingly, he raised his face to the sky and stared, and as he looked there struck him sharply on the cheek,

something that seemed to burn like fire. He put up his hand and felt it—then drew it sharply away and looked at it half in awe. Why, it was damp, even wet, from the feel of his cheek. Not the heated damp of sweat, but a cool, fresh damp as from the water of a running stream. But, of course, that damp couldn't be. There was something wrong somewhere.

He listened. There was a pattering sound about him, and even as he raised his face a dozen of those spots of fire seemed to strike him on the forehead, on the cheeks, all over the face. He put up his hand again and rubbed it slowly and methodically all over his features, kept rubbing it, it really felt so cool and moist. He noticed, too, that the pounding and pattering kept up, yet only gradually did it seem to dawn on him that there was a coolness in the air—and something else.

Already the wind had passed, and now he knew why. It was being driven off, being driven by some little black clouds that were coming up the valley, and with the clouds came the tears of the Heavens themselves, real tears, wet tears, tears of rain—rain, aye, the rain had come, the rain had come.

COLORADO GRAZING NOTES

A STATISTICAL review just made of last year's grazing business on the Colorado national forests shows that there were 8,382 more cattle and 599 more horses grazed during the fiscal year ended June 30, 1913, than during the previous fiscal year. At the same time there were 150,121 less sheep and 607 less goats.

The reduction in the number of sheep was due primarily to a falling off in the feed-in-transit shipments from States west of Colorado. Under this plan buyers purchased sheep in States west of Colorado and summer them in that State en route to Missouri River market

points. This year the operations of these men were much less extensive than formerly, and a large amount of sheep range, with abundant pasturage, was vacant on the Colorado forests.

Nevertheless, 2,758 grazing permits were issued, and the stock covered by these permits included 259,342 cattle, 9,400 horses, 627,715 sheep, and 1,472 goats. These figures represent about 24 per cent, or nearly one-fourth, of all the cattle, 3 per cent of all the horses, and 36 per cent, or more than one-third, of all the sheep owned within the State of Colorado.

ECONOMIC FACTORS IN PRIVATE FORESTRY WORK*

By E. A. STERLING

Forest and Timber Engineer

PRIVATE forestry in its full commercial application is essentially the production of successive forest crops from the same land, through the employment of private capital. If private capital seriously engages in forestry it will apply the scientific and business principles most effective in affording safety and profit the same as in any other industrial enterprise.

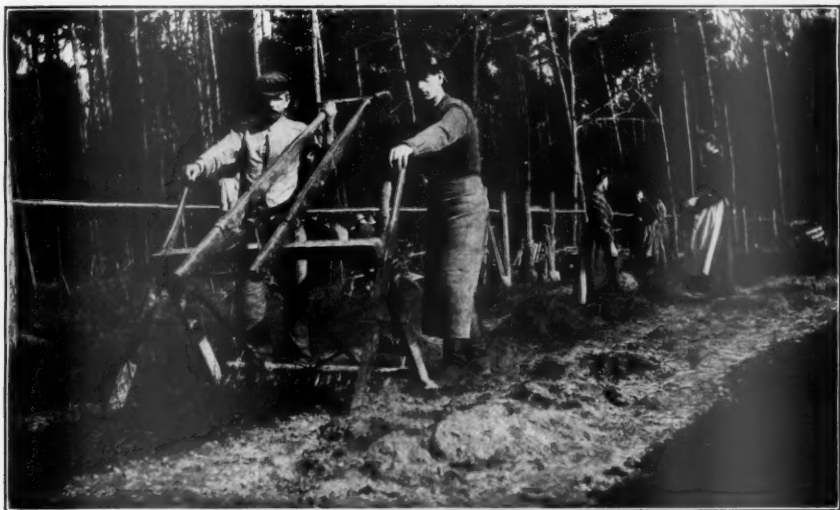
Forest crops, with no exceptions, require longer to mature than any other living, growing product of the soil. They are, however, as much a crop as wheat or corn, and, in older countries are grown in systematic rotation like other crops. Failure to realize this fundamental fact is no doubt responsible for much of the misconception as to what scientific forest management involves. Moreover, the existence of so much mature forest growth has established a conception of forests as a mine rather than as a crop. Even when the principles of forest economics are fully comprehended and the necessary procedure and ultimate profits carefully figured out, a sober long time investment in growing timber crops proves less attractive to American capital than the more speculative exploitation of existing forests. A story illustrative of this point was told in the forest schools ten years ago of two German capitalists who came to this country to invest in timber. The American lumbermen who acted as hosts showed them various properties and operations where profits of 15 or 20 per cent a year were assured, but the visitors refused them all on the ground that they wanted a safe timber investment paying not over 5 per cent. This was before the day of timber bonds, and the Americans had no investments of this kind to offer, so the Germans,

since they wouldn't take the high speculative profits, went home with their money. Neither understands the other's point of view to this day.

The conditions described will probably hold until most of the old virgin forests, which have been our sole source of supply, are cut-over. When this time comes and original forest growth is no longer obtainable at less than the cost of production, which has always been the case with even the highest priced stumpage, systematic production of forests as such will be accepted as a business proposition. Fortunately, there is an intermediate period when the old forests will still constitute the main source of supply, but new fields will not be available, thus creating a tendency to perpetuate the supply on large holdings by producing new growth on the cut-over areas. This necessitates large operations and ample capital, and emphasizes Dr. Schenk's truism that: "Forest conservation has never been practiced by the small holder of timberland. We must have either public or private corporations—lumber barons—engage in it."

FORESTRY AS A BUSINESS.

Forestry as a recreation or experiment is quite different from forestry as a straight business enterprise, which must earn fair profits. The former has constituted most of the activities up to the present time, and is extremely helpful in developing methods and arousing public interest; while the latter, although it does not exist as a fully developed business policy, is developing through protection and other measures absolutely essential to private forestry. It has been said that "forest conservation is more expensive than forest waste, in the immediate future." This



THE COST OF REPLANTING IS ALWAYS AN IMPORTANT QUESTION IN PRIVATE FORESTRY. This shows a tract of land on which eight thousand two year old Scotch pine were planted per acre at a cost of \$16, the seedlings costing 15 cents per thousand. This was in Germany, however, and costs here would doubtless be higher.

statement will bear modification according to regional or local conditions. It would certainly be true in the heavy forests of the Pacific Northwest, where the elimination of waste is impossible with present market and transportation facilities, but even so fire protection, which is an initial and indispensable factor in conservation, is intensely and successfully applied. Fire protection is also practised successfully in the Northwest, and here close utilization is far more feasible. As an example, today the small hardwood mills in southeastern New York are paying as high as \$12 per M. for logs 6 inches at the small end, and many of them are so knotty and crooked they won't lay still on a skidway. On the Pacific coast the finest No. 1 logs, running practically all clear 30 inches and up, are going begging at less than \$10 per M. The answer is enormous reserve supply and overproduction in one case, and scarcity and a ready market in the other. A surfeited market and excess supply will mean excessive waste until conditions change.

FOREST CONSERVATION NECESSARY.

Whatever the present status of private forestry, and the conditions which retard or encourage its development, there will come in the near future, and there is even apparent today, a national need for the maintenance of an adequate timber supply from public and private forests. All that is necessary to interest private interests in forest crop production is a sustained demand for lumber and for minor products at a price which will make their production profitable. Broad public interests demand forest conservation for special purposes, as watershed protection, and these, together with an indeterminate amount of general lumber production, will be provided by Federal, State and municipal agencies.

After our present stored-up natural heritage of timber is exhausted, future supplies will have to come from trees which have grown on land maintained in forest and not suited for agriculture. These future wood supplies will come from three principal sources. First, the National Forests and the State For-

est Reserves, on which timber has been systematically protected and grown as a crop; second, from forest growth which has sprung up voluntarily on cut-over lands, and has escaped fire and reached maturity without being systematically planned for or protected, and third, from individual or corporate owned forest lands which have been devoted to forest crop production as a private business enterprise under scientific long-time management.

WHAT OF THE FUTURE?

The development of private forestry operations will be a potent factor in determining whether forest crops adequate for the nation will be available in the future, when the inaccessibility or exhaustion of the stored supply forces dependence on new crops. The fact that private timberland holdings outnumber Government and State lands about five to one, in the matter of timber volume, makes the ultimate use of these private lands of predominating importance. We have 82 per cent of our forests under private ownership; German 46½, and these under state control.

Another important factor is that private timberlands, as a rule, are more accessible and usually capable of more profitable forest management than Government or State forests. In fact, even with the most extensive and complete development of transportation which can be anticipated, much of the National forest land will always be difficult of access, and, to this extent at least, incapable of the most rapid and economic forest production. Furthermore, a considerable percentage of the public forest lands will be maintained primarily for watershed protection; and while timber will be produced from such areas, the output will be limited to the amount which can be spared without materially reducing the water-conserving power of the forested area.

Considered from a broad, national standpoint, very extensive areas of privately managed forest land will be necessary in the future unless there is an extensive transfer of timberland from private to public ownership, or an in-

crease in use of substitutes which will reduce the demand for wood to a consumption which the National Forests and State reserves can supply. It is not likely that either of these developments, or a combination of the two, will occur. At any rate, it is certain they will not come in time to destroy present public interests in measure for forest production on private owned lands.

It is against the traditions and principles of our Government to purchase and operate private industries; and whatever the measure of control ultimately exercised, public ownership of enough non-agricultural land to supply the country's needs for timber is not a reasonable expectation.

In the matter of consumption, we may look in the comparatively near future for reduction in the amount of wood used per capita; and the opinion is even now expressed that our gross consumption has passed or is near its peak. Even if the increasing use of substitutes decreases the per capita consumption, we must reckon with a rapidly increasing population, and also consider that the rural communities, where the greater proportion of our population still lives, will continue the almost universal use of wood, even though our cities become of steel, stone and concrete.

NO DECLINE IN DEMAND.

Moreover, historical data from other countries show that whatever the use of substitutes in most fields, the railroads and the paper and pulp plants require a constantly increasing amount of wood.

In other words, the curve of timber consumption is not likely to decline rapidly enough to make our reserve timber supply, even in conjunction with voluntary new growth, adequate for our needs without a supply from intensively managed private forests. It is more probable that a greatly reduced per capita consumption will not come until the virgin supplies are nearly exhausted and we find ourselves, some thirty or forty years hence, with the old growth nearly gone, and the new



IF THE PRIVATE OWNER DESIRES TO REPLANT HIS DEFORESTED LAND HE MAY USE A TRANSPLANTING MACHINE SUCH AS IS USED IN GERMANY, AND BY WHICH ONE MAN AND FOUR GIRLS TRANSPLANT 18,000 SEEDLINGS DAILY.

not large enough, and lumber prices at a point which will force economy in the use of wood and make private forestry profitable.

FOR FUTURE USE.

Just as a forecast of the part private forest lands will play in future production, let us assume the improbable possibility that fifty years hence our wood consumption will be as low as that of Germany today, or 18.8 cu. ft., or 225 board feet of saw timber per capita. Assume also that during the same period our population has increased to 175,000,000. On this basis, with a per capita consumption of 18.8 cu. ft. of solid wood, our gross consumption in board feet would be about 39,000,000,000 feet, or practically what it is today.

The National Forests are estimated to have a potential output for all time of 6 billion feet per year, while the State forests might eventually produce a billion feet annually, or a total, from public forests, of 7 billion feet. This leaves 32 billion feet to come from private forests if our needs, on the eco-

nomical present German basis, are to be supplied. German private forests yield per acre about 200 board feet of saw timber per year, so our private forests would have to comprise 160 million acres under intensive management to produce the needed 32 billion feet. Our present area of private or unreserved forests is about 440 million acres, so on at least 36 per cent of this area private forestry needs to be practiced if we are to have enough wood. In the above, cord wood, which constitutes about half of the gross wood consumption in most countries is ignored, since it is low grade material which will probably be available on farm woodlots and from tops and waste for all time.

PRIVATE FORESTRY DEVELOPMENT.

The development of private forestry in the United States, from an historical standpoint, will have to be recorded by the next generation because up to the present time intensive private forestry on a scale which establishes its commercial feasibility has not been undertaken. Sporadic attempts have been made all over the country to practice

forestry, and some are fairly good examples of what should be or what should not be.

Most of these operations, however, go only part way and are usually dependent, at least in part, on some other factor than that of timber production for profit. Corporations and institutions are sometimes owners of timbered land which they must hold in any event, and in such cases timber production helps to pay the carrying charges, or even may take care of expenses and show a net profit.

One of the earlier activities of the old Bureau of Forestry was the preparation of complete forest working plans in co-operation with private owners. These were usually based on a very careful forest survey, from which a working plan was prepared which indicated to the owner the methods of cutting which would make his operation continuous. It is significant that in practically no case were these plans carried out, to the extent of full application of methods which would assure continuous forest crop production from the same land.

No blame for the failure of these working plans can be attached to anyone, and in several respects they have proved of lasting value through indicating the possibilities of close utilization and of protection. The Federal Forestry Bureau first of all lacked experienced men who could outline plans and methods which would be considered practical by the hard-headed lumbermen. Timberland owners, on the other hand, have to meet very strict commercial conditions, and if advanced methods of operation could not be made to pay, they obviously could not



THIS STAND OF TREES IS AN EXPERIMENTAL PLOT OF DOUGLAS FIR. IT IS TWENTY-SIX YEARS OLD AND PRODUCES SIXTY-TWO CORDS PER ACRE.

be followed. Moreover, they had to be made to pay then and continuously to fully the extent possible under the usual methods, and not in the distant future, even though the ultimate profits would have been greater than by their usual methods. Stockholders, even in lumber companies, want dividends now, not fifty years hence. In other words, we seem to be rather slow to appraise and appreciate the commercial conditions under which private forestry is possible, and to work out and apply the unvarying principles of forest econom-

ics upon which private forestry in America must be based.

PUBLIC DEMAND HELPFUL.

The public demand for forest conservation has been helpful in calling attention to the national importance of the question and to the direct personal interest which it has for every citizen. On the other hand, the somewhat unreasonable clamor of enthusiasts who have no personal interests at stake, has retarded progress, because it has put the lumbermen on the defensive by accusing them of deliberate wasteful and reckless methods.

For some ten years there has been a ceaseless propaganda for better management and wiser use of timberland and a constant controversy as to what should be done, most of it being the well-intentioned agitation of those who could do little more than talk; while the lumbermen, who really control the destinies of our private forest lands, sat back and said nothing. While this has been going on, industrial conditions as they affect the forests have materially changed, so that with the awakened public interest as it now exists, there is greater hope of definite accomplishment.

Present tendencies indicate a more helpful and logical development than at any time since forest conservation became an issue. Instead of attempting to put immediately into effect the complete policies and intensive methods of management which are scientifically correct, at least in older countries, things are now being done which are logical steps in the development which may ultimately lead to intensive forest management on private forest lands. Instead of asking the private owner to cut by a system which will curtail his output and reduce present profits for the sake of perpetuating new growth, by merely stating in an indefinite way that fire protection, for example, is essential in applying these methods, the private owner is now being shown that protection from fire is possible by systematic methods and thorough organization, and that it pays. He is also learning by what means and in what

ways he can utilize material which was formerly wasted, and at the same time maintain a more effective organization. While these are not the things which theoretically constitute complete forest management they are unquestionably initial steps which must be worked out before anything more intensive can be attempted.

What is more logical than that the successful fire prevention methods in the Northwestern States and elsewhere, as applied by private owners through co-operative fire patrol associations, should soon lead to a realization that a fine stand of voluntary young growth has come up on cut-over areas? Later, when it becomes apparent that this young growth is worth having because of its potential value, it will be a natural step to modify logging methods so that more and better young growth will follow the logging operations. If these things work out and the owner sees a profit in holding his land because of this young growth, he will begin to think about planting up areas which have been burned or which have failed to reseed naturally. Each one of these steps leads closer to the kind of private forestry which will provide a timber supply for the future and earn a reasonable profit for the owner.

From the academic standpoint this should all perhaps be definitely planned for in advance and an intensive system of management worked out on paper for application in the woods. The fact is, that under present conditions the average private owner will not consider applying such a plan, but he will be guided by the current developments which indicate from time to time a change in methods which will be profitable. With better fire protection and closer utilization, wherever the market justifies it, must be expected to come reform in forest taxation and in State forest laws, which will permit capital to remain invested in forest lands with reasonable assurance of a fair return. Even at best the average timberland owner is not going to make a large profit from practicing forestry, although under ideal conditions it would be a gilt-edge investment. In

some regions and under certain conditions the State is justified in proffering assistance through co-operation and in planting and fire protection, and everywhere tax laws should be passed which do not impose a heavy burden on the crop while growing and earning nothing, and therefore not in a position to pay.

Of all the large timberland operations in the United States, not a single case may be cited as an example of intensive forest management of the kind taught in schools and seen by every forest student who visits Germany. It may also be safely said that no large lumber company could apply ideal methods without going broke, and this condition will hold true until commercial conditions affecting the lumber market materially change. Another consideration is that our irregular virgin forests are not adapted in their present state to the refined principles of forest management. In most cases they must be cut and started all over again in order to practice real forestry, and it will not be until the end of the first rotation, or at the time the new growth is ready for cutting that anything widely approaching normal forest conditions can be obtained. These conditions, however, have got to be faced, and should not be a bar to the application of improved methods as fast as conditions permit.

A number of examples of private management, which include at least some of the things which are feasible today, are found throughout the United States. On the ground that fire protection is the first essential, much encouragement is found in the willingness of a large number of private owners to co-operate fully, and contribute freely towards co-operative fire association work. While in some cases nothing will be done beyond fire protection, every owner, whether East or West, who takes an interest in fire protection work, is taking the first step towards the practice of private forestry.

PRIVATE FORESTRY IN THE NORTHEAST.

In the Northeast the most notable advance towards private forestry in ad-

dition to fire protection, has been taken by the large pulp and paper companies. Here again German forestry methods are not practiced, because they would not pay; but definite provision is being made for producing successive crops of timber to supply the large permanent pulp mills, and the tendency is strongly towards the consolidation and long-time management of holdings, advantageously located from the standpoint of transportation and forest conditions, for the permanent production of pulpwood. In the same general region many small owners have already reaped a good profit from growing and utilizing second growth timber, particularly white pine; and while most of these operations are on too small a scale to materially contribute to the needs of the country, the aggregate of such operations is too large to be ignored. If it would pay to cut within the last ten years second growth timber which was forty or fifty years old, it will certainly pay much better to start new growth now for cutting fifty years hence.

In the Southern pine region, natural forest conditions are in many places favorable for private forestry, although up to the present very little has been done even in the way of fire protection. Conditions are favorable to the extent that young growth comes up very readily where fire is kept out, transportation facilities are good, and logging costs are comparatively low. The principal drawback is the slow rate of growth of the longleaf pine, but in many regions this species can be replaced with trees which come into maturity much faster.

In the yellow pine region of Texas, a lumber company, with very large holdings, has been quietly operating for some years with a view of producing successive crops from the same land, and apparently finds that it pays. In South Carolina another concern investigated thoroughly the possibilities along this line and found that 100,000 acres of land on which loblolly pine predominated would produce, under a regular system of cutting, the normal mill output of 200 million feet annually for all time. The methods which would



HERE A WOODLOT SERVES A DUAL PURPOSE, PROTECTING THE GRAIN FIELD BY SHIELDING IT FROM THE WIND AND FURNISHING THE FARMER WITH A YEARLY CROP OF WOOD.

produce this result were followed for a short time and promised to work out successfully; but, owing to some difficulty in applying systematic fire preventive measures, the whole plan was abandoned. It nevertheless illustrates the possibilities, and it is probably safe to say that systematic fire protection would have paid even if long-time management had not been contemplated.

In the Pacific Northwest organized fire preventive measures have been carried farther than anywhere else, and the point has been reached where the fire hazard no longer constitutes a bar to forest production. In the same region scientific management is being applied in connection with saw-mill and logging operations, and a higher degree of efficiency in the manufacturing end will ultimately prevail in many companies. These and the many similar activities are the most tangible indications we have of the crude beginning of private forestry on a commercial scale.

FAR FROM AN IDEAL SYSTEM.

The ideal in private forestry work need be given little space, because it

will be attained only by evolution and will not be seen by anyone who is interested in forestry problems today. Merely to show how far we are from an ideal system, it may be interesting to outline briefly what we would find in such a forest. It would be necessary, first, to assume that the State in which the forest was located had provided wise forest legislation under full enforcement, and a system of forest taxation which encouraged rather than hindered forest production. We would also have to assume ample transportation facilities and a ready market for practically all forest products.

With these conditions existing, we would find that the woods operations were based on a complete topographic and type map, supplemented by volume tables indicating the amount and size of the timber by species. The mill output would be adjusted to the amount which the forest could safely produce each year, without reducing its productive capacity, and the cutting area would be confined quite strictly to the definite limits decided upon. In the woods every tree felled would be carefully worked up so as to produce the



ONE FEATURE OF PRIVATE FORESTRY ON A SMALL SCALE IS IN THE VALUE OF A DENSE GROWTH OF TREES AS A WIND BREAK.

maximum number of logs in the lengths which would bring the highest value when sawed. After the logs were taken out, the tops would be converted into cordwood and the refuse remaining carefully piled for burning. Under a system previously decided upon, provision would be made for new growth either by leaving seed trees, cutting in strips, or by some one of the various regeneration systems best adapted for the local conditions.

The saw-mill would be equipped with machinery to eliminate hand labor as much as possible, and the logs would be sawn by the finest and thinnest bands to prevent waste. There would be no burner in connection with the mill, and slabs and odd pieces not available for lumber would be worked up into various minor wood products for final disposal. The waste which could not be worked up into marketable form would either be used as fuel or, if coniferous wood, turpentine would be extracted; or, if hardwood, converted into by-products through destructive distillation. In other words, both in the woods and in the mill, close utilization would be practiced, and definite plans followed for growing successive timber crops, not merely a second crop.

Fire protection would be an essential and continuous part of the system, the forest would be patrolled and fire watch

kept from lookout stations, and all the refined methods practiced which assure a minimum number of fires starting and the prompt suppression of those which occur.

ACTUAL CONDITIONS TODAY.

Turning from our ideal privately-managed forest to a consideration of conditions which actually confront lumber manufacturers today, we find a state of affairs not altogether encouraging to private operations. Private timberland owners, who must naturally operate so as to give the highest returns on the capital invested, and who also desire to be good citizens and do what they can towards conserving the forest resources of the country, are confronted by at least two distinct sets of conditions. The first is the one involving the broad economic conditions of market, transportation, competition, taxation, and finance; the other the inside details of logging, milling, labor, and fire protection. While it is true that men engaged in other industries are confronted with these same problems, the lumber business in many ways is on a less stable basis than other manufacturing industries and capable of less refinement.

Among the broad economic considerations, transportation plays an important part. The distance and freight



WESTERN YELLOW PINE REPRODUCTION ENCROACHING ON GRASSLAND
NEAR THE LOWER ELEVATION OF THE WESTERN YELLOW PINE TYPE.

rates from the point of production to the market are determining factors; while in addition the lumber manufacturer must provide his own transportation facilities from where the timber stands to the mill, and not infrequently from the mill to the railroad line. He caters also to a fickle market and one which may demand all or only part of his products. Moreover, the manufacturer is unable to dictate the sizes and grades he produces, but must meet to a large extent the arbitrary requirements of the consumer. With many manufactured articles this is comparatively easy; but since trees grow as Nature provided, and not always as man desires, the lumberman must take his trees as he finds them and do the best he can towards making them meet the requirements of a market which does not consider these fundamental facts.

Competition is to be expected, and between the larger concerns it is no more serious than in other industries. The small lumber producer, however, with his vest-pocket saw-mill, often creates a form of competition which it is difficult to meet. The small mill is often a family affair, and in any event represents mainly the labor involved,

against which the large operator must figure his heavy overhead charges and expensive equipment. Financing lumber operations offers no unusual difficulties except that the capital invested in private timberlands must usually be tied up for a long period, and until within comparatively recent years there was no systematic basis for issuing timber bonds.

THE TAXATION QUESTION.

The taxation of timberland deserves a separate article, and it is only necessary to say that it has actually been true in some cases that the imposition of the general property tax on timber has forced rapid cutting even under conditions which made a large output unprofitable; while some of the new tax theories advocated, by giving no consideration to forests, might prove even worse than present systems.

Most of the broad economic problems which confront the lumbermen are not more serious or more difficult of solution than in other industries, if the lumbermen merely lumber without regard to conservation. It is true, however, that the present economic influences are not favorable to intensive forest crop production. The margin



LARGE BURNS IN THE TRANSITION TYPE WHICH ARE IN NEED OF REFORESTATION.

between manufacturing costs and selling price of ordinary grades of lumber is too narrow to permit of any radical change of methods, nor will it permit keeping heavy investments of capital too long tied up in one operation. The carrying charges as represented by interest and taxation are not fully offset by increased stumpage values, nor is it always possible to increase the output in order to take care of these charges, because the market will not absorb a greatly increased production.

STUMPAGE VALUES AND LUMBER PRICES.

It is generally recognized that stumpage values never go down, whereas lumber prices frequently do. At the present time, for example, the average prices for coniferous lumber in ordinary grades are no higher—and in some cases they are lower—than they were 25 years ago. At the same time stumpage values of many woods are two or three times higher. This simply means that if an operating lumber concern buys stumpage today, there may not be enough margin between the cost of production and the selling price to justify operating; although many plants are kept running under these conditions because of the necessity of keeping the

organization together and of securing ready money with which to meet current obligations. There can be no conservation under these conditions. High stumpage and low lumber values mean quick liquidation where possible, and all the attendant evils of over-productions, waste, and abandonment of the cut-over areas to fire destruction and tax sale.

In the Pacific Northwest where there are large reserve supplies of timber, it is freely said today that the millmen can not afford to buy stumpage at present prices, nor even to buy logs in the open market for manufacture into lumber. It is also frequently said, and often without exaggeration, that most of the money made in the lumber business is in selling stumpage which was bought at the lower price of a few years ago. If these statements are true, it is very apparent that long-time management, which must necessarily involve manufacturing, would not be a profitable enterprise.

In addition to the general conditions which influence private forestry, there are many operating details which affect any variations from the usual practice. The danger from fire is still a fundamental handicap in many regions,



REPRODUCTION COMING IN AFTER LOGGING UNDER THE OLD METHODS.

and fire will always threaten the destruction of new growth, if not mature timber, in the greater portion of the country. Even assuming that the fire hazard will be reduced to a safe minimum, the operator in many regions still has no clear way to practice the close utilization which is an essential of private forestry. It is simply folly to bring material from the woods to the mill which can not be sold at a fair profit after being manufactured. It is practically certain that many mills today are losing money on much of their low-grade material, merely because they have not figured carefully enough on the relation between the cost of producing low grades and the price received.

LUMBERMEN NEED INSTRUCTION.

If the evidence was all in, it would make convincing testimony as to why the private timberland owners, as a class, can not practice close utilization or indulge to the full in intensive forestry methods. On the other hand, it is equally certain that there are many cases where these same private owners do not do as much as they could or should in applying the measures which will ultimately make private forestry possible. In fact the lumbermen, tak-

ing the country over, come in for a lot of just criticism. They have not studied the broader phases of their own business as they should, and not infrequently the administrative heads have allowed themselves to be hopelessly dominated by subordinates who were in a rut or had only the one personal ambition or desire of maintaining a reputation for a certain log output or cost basis, regardless of waste, fire, or anything else. Also in the matter of waste possibilities have been overlooked through failure to determine just what could be utilized with profit. Another neglected factor is that of records, cost data and general administrative details. If the lumbermen shake off the spell of custom and apply advanced methods adapted to their business they will find that much can be done at a profit which they have thought could not be done at all. When they do get out on the firing line with advanced business and technical methods, private forestry will receive an impetus which will develop it to the full extent of its commercial limitations.

In nearly everything which attracts public notice there is invariably someone, usually a rank outsider, who propounds a complete remedy for the problem under consideration. The question



THRIFTY STAND OF RED AND WHITE FIRS. IN BACKGROUND DENSE BRUSH ON SOUTH SLOPE.

of private forestry is an exception, and we rarely hear any plans or theories advanced which would make possible the practice of private forestry. It is quite generally recognized by those who have given the most thought to the subject that neither radical nor rapid developments are to be expected; that gradually, as conditions justify it, more and more private land will be devoted to systematic forest crop production. There are many, however, who argue that private forestry will never be commercially feasible, or at any rate, not in time to contribute materially to our wood supply at the time that we will most need it. The suggestion most freely and frequently offered is not to try to practice private forestry at all, but to turn the whole job over to the States and the Federal Government.

On the ground that over-production is one of the greatest retarding influences on forest conservation, the suggestion has been made that the Federal Government control the lumber output. Since the lumber manufacturers seem unable to get together on this point voluntarily, this suggestion would perhaps solve the immediate difficulty which will never be solved in any other way. When, however, an attempt is

made to work out the details of such control, unsurmountable difficulties seem to arise. Among the first questions to arise is, what constitutes over-production? and another of equal importance concerns the effect upon the consumer if the output is limited. The lumber manufacturer would naturally expect a curtailment of production to maintain and probably increase the selling price of lumber, and to this extent he would be entirely satisfied if the increase was sufficient to give him the same net returns as with the smaller output and the lower price. In this case, however, the consumer would have to pay the bill, and such a policy would not receive public approval. Such a policy might also act as a boomerang to the lumberman because the higher prices of lumber would result in the increased use of substitutes and the consequent permanent reduction of demand.

Another difficulty in the way of Government control of output is to reconcile the needs for various classes of material. A flat reduction in all grades and species would not be practical because some woods, on account of their scarcity, are always in demand at a high price, while others, such as the yellow

pine and red fir, because of their abundance, are usually available in excess of demand. The yellow pine producers would be very glad to have the red fir output curtailed, but would strenuously object to a reduction in their own mills, and vice versa.

Present tendencies are somewhat toward Government regulation and control of all corporate interests, and if this was ever applied to private timberland operations, it might be expected to lead to regulations which would force measures for forest conservation and to scientific forestry on private holdings. Since it is quite evident that intensive forestry can not be practiced profitably under present conditions, the only way the private owner could keep in business under such an arrangement would be to materially increase the price of the lumber produced. This in turn would again put the burden on the consumer and evidently so reduce the consumption that private forests would not be greatly needed as a source of wood supply. Whatever the constitu-

tional or legal phases of the question of State or Federal control, it can hardly be conceived that anything in the way of limitations approaching confiscation of private forests, even for the public good, will be tolerated without proper compensation.

Private forestry is needed to provide future wood supplies for the nation. It is not practiced today on a commercial scale because of economic conditions which make straight lumbering a more attractive investment. Some of the things essential to private forestry, particularly fire protection, are being applied extensively and successfully.

Private forestry must come as an evolutionary development, not because the public demands it but because private timberland owners find it profitable to practice it.

Public comprehension of the principles of forest economics, and the realization that forestry is successive wood crop production must precede the full application of the art and science of private forestry.

* An address at the Fifth National Conservation Congress, November 19, 1913.

EXPLOITING THE NATIONAL PARKS

SECRETARY LANE is considering plans for bringing the attractions of the national parks to the attention of European tourists. Through the co-operation of the State Department a series of questions is to be sent to each consular officer in Europe with a view to obtaining information regarding the best method of disseminating information. Euro-

pean travelers have generally been enthusiastic in their praise of the beauties of the national parks, and a number of descriptive articles have been printed in English, German and French journals. Secretary Lane believes that our natural and national wonders might be presented to the European traveling public in a way that might stimulate the interest of the foreign tourist.

6,000 FORESTERS.

There are nearly 6,000 professional foresters in Germany who are associated with various technical societies.

NEW FIRE FIGHTING TOOL.

A tool used to fight fires on the California forests combines a rake, spade, and hoe. It is compact so that it can be carried on horseback, and weighs less than 5½ pounds.

FOREST STUDENTS ON NATIONAL FOREST.

The University of Washington has secured the use of two sections of land on the Snoqualmie national forest in connection with its forestry courses.

LUMBERMEN AND OUR NATIONAL DEVELOPMENT

By R. C. BRYANT

Professor of Lumbering at Yale College

LUMBERING has been an important industry in the United States from the time of the first settlement on the eastern shore of our country. It is said that the first ship which returned to England from this country carried a cargo of clapboards to the Mother Country. The colonists, surrounded on every hand by the primeval forest, found that lumber and logs were products in demand in Europe, and the hewing of timber and the manufacture of clapboards, staves, and other wood products soon became of great importance. Lumber at times was used in the colonies, in lieu of currency, for the payment of taxes and the settlement of other financial obligations.

In the last half century the United States has passed through a period of remarkable commercial growth and expansion in which our natural resources, especially coal, iron and timber have played a very important part. The pressing demands of business overshadowed serious thoughts of the future and our natural resources were exploited on a very large scale to meet the needs of the country. Extravagance and waste in timber cutting were pardoned and encouraged by the public, since cheaper and more abundant building materials were thus made available.

In recent years with business interests well established, a national interest in our future has arisen and the public have suddenly awakened to a realization that our natural resources are not only exhaustible, but are fast being depleted. The tendency now is to criticise those on whom praise was formerly bestowed. Such chameleon-like changes of public sentiment are not uncommon in a republic like ours, but none the less, they carry with them an element of injustice.

Lumbermen and the lumber industry have had their full share of adverse criticism during the last two decades, both from the public and the press. While lumbermen, as individuals, have made mistakes, as a class they have been as public spirited as men engaged in any other large industry.

Some of the charges against lumbermen are that they have devastated and still continue to devastate vast areas of timberlands without making provision for future wood crops, and that through organizations and other means they have attempted and still attempt to control the standing timber of the country, its manufacture, and also the sale of the finished products. To the latter, many attribute the gradually increasing cost to the consumer of lumber and other forest products.

It is true the lumber industry has been instrumental in clearing extensive areas of land which later were devastated by fire. In many cases, however, these same areas later became valuable agricultural properties. Waste from fire was a natural result of pioneer development, both because of the struggle of agriculturists to clear their land and also because as a nation we then did not feel any concern for the extensive areas of timberlands which occupied such a large proportion of our continent. Individuals owning a very small per cent of the standing timber were not interested in forest fire prevention because choice stumpage could be secured for a very low price, and it would have been impracticable to have attempted to protect their small private holdings in the midst of a vast unprotected public domain.

PROTECTING TIMBERLANDS.

Lumbermen are now in the foreground in all matters pertaining to the

protection of timberlands from fire, and as a nation we owe much to them for the effective methods they have adopted for the prevention and control of forest fires. The loss of timber on private holdings, even during certain recent years when the fire menace was great, has been kept at a minimum by the expenditure of large sums of money in patrolling the forest areas and in enlightening the public in regard to the resultant economic waste.

Lumbermen have proven most valuable allies in the campaign against the forest fire evil and hearty co-operation between Federal, State and private interests has been manifested from the first. While interested primarily in the protection of their own property, they likewise protect many other holdings which are interspersed among their own. The effective steps which have been inaugurated by them have been a benefit to each and every citizen of this country through the prevention of the waste of our virgin forest resources, thereby prolonging the time when we will feel a marked scarcity of virgin timber supplies.

Forestry principles have not been applied, to any extent, on the holdings of lumber companies for several reasons, the most important of which is that forestry will not yield as high financial returns as other forms of investments. The usual rate at which European foresters figure returns is 3 per cent, and it is doubtful if forestry in this country, even in the distant future, will yield more than this rate on the investment.

Many lumber operators are conducting their business, at least to some extent, with the aid of borrowed capital, and having financial obligations to meet at stated intervals, their interests are centered largely in present profits rather than in hypothetical future ones. Forestry, yielding a maximum revenue of 3 per cent, does not appeal to an operator who would have to borrow money at 5 or 6 per cent to finance the work.

The rapid cutting of our forests and the waste which has accompanied it finds a parallel in the history of the early development of the forest re-

sources of European countries. Private management of forests in Europe has not been a success because of the low financial returns and the lack of continuity in ownership and policy, both of which have led to the rapid cutting of the timber for commercial purposes. The only examples of successful management of private timberlands in Europe (successful from the standpoint of forestry but not from the financial returns to the individual) are on those estates over which the government has exercised control and dictated the policy that has been pursued. In the United States paternalism is distasteful and it is doubtful if, for many years, there will be legislation for the public control of private timberlands which contains more drastic provisions than those necessary for the purposes of protection.

There are also other reasons why forestry is not practiced on private timber holdings. There is today under forest, especially in the South and the West, very extensive areas of potential agricultural land which will be required for farming purposes during the next two decades. The welfare of the community and the financial interests of the owners demand that these lands shall be opened to settlement as they are needed. It would be unwise, therefore, for lumbermen owning such lands to attempt to practice forestry on them, since before a timber crop could reach maturity the property would be required for agricultural purposes.

FIFTY PER CENT FOR MARKET.

Unfortunately the market for forest products is such that the lumberman is unable to sell more than about 50 per cent of the total wood content of a tree, therefore, much refuse in the form of stumps, limbs, knotty tops and defective logs is left in the forest, constituting a serious fire menace. Even with the efficient fire preventive measures which are now in force, the lumbermen look somewhat askance at any plan which aims to leave merchantable timber on their holdings for successive crops. Further, the liability of changes in the form of taxation and the uncer-

tainty of future legislation affecting the privately owned forests are features which tend to retard favorable consideration of forestry on the part of those lumbermen who are best able to practice it.

There has been much discussion during recent years, about the rapidly increasing consolidation of private timberlands, especially in the Northwest. This tendency has been ascribed to the desire of powerful lumber interests to control the raw material and to monopolize the manufacture and sale of forest products. It is true that during the last two decades certain large holdings have been brought more or less under one management, yet this has not so far proved a calamity and in the future it may be a benefit to the country. One of the great evils of the present method of lumber manufacture in the United States is that the mill capacity exceeds the market demands, and because of the necessity of securing funds to carry the heavy debt incurred for stumpage and plant, these mills in normal times produce more lumber than the country requires. This results in a waste of material both in the forest and at the manufacturing plant, since close utilization is never a partner with over-production.

If lumber manufacture were concentrated, subject to proper governmental supervision, in the hands of fewer companies possessing ample financial resources, the evil of over-production would be largely eliminated; more close utilization would result; and the country at large would be the gainer because the output would be regulated by market requirements rather than by the financial status of numerous mills whose obligations demand the immediate manufacture and sale of lumber.

As consumers we must expect to pay more for lumber in the future, not because of monopolistic control of the lumber business, but because of the greater scarcity of raw material; the growing increase in the cost of labor; which constitutes a very large item in lumber manufacture; and the higher cost of supplies and machinery of all kinds.

It is admitted by many who have carefully studied the present situation that lumber today does not command the price that it should when viewed from the standpoint of the raw product available; close utilization; and the prospects of growing a future supply.

The public have been misled by the rapid rise in the present cost of frame-house construction, attributing it chiefly to an increase in the cost of lumber, while in reality it can be traced largely to added labor charges and to increased cost of supplies other than lumber. A comparison between two houses of the same size and type, one of which was constructed in 1903, the other in 1912, at an advanced cost of 15 per cent, shows an increase in lumber cost of 4 per cent; on carpenter work, 20 per cent; on plumbing, 13 per cent; on brick work, 15 per cent; on plaster, 23 per cent, and on tin work, 14 per cent. On houses of average size the cost of lumber and mill work is seldom greater than from 25 to 30 per cent of the total expense of the building. It can be seen, therefore, that the 4 per cent increase in the price of lumber and mill work had little to do with the higher cost of the building erected in 1912.

The misconception held by many as to the part played by lumber trade associations in regulating lumber prices was discussed by the writer in the October issue of AMERICAN FORESTRY. The impracticability of controlling prices in an industry in which 50,000 individuals and companies were engaged in the competitive manufacture and sale of lumber was there pointed out.

BENEFITS BY LUMBERMEN.

The benefits which have been bestowed on this country by lumbermen and the lumber industry are many. Lumbermen have been the pioneers in opening up new territory for settlement, agricultural and other industries following in their wake. Many of the towns in New England, New York, Pennsylvania, the Lake States and other parts of the country owe their origin and development to the sturdy pioneer lumbermen who hewed their

way through the wilderness and made possible the settlement of the country. The cut-over lands offered an opportunity for the agriculturist and lumbering in the region provided him with a market for the food products he raised in excess of his own needs, and also furnished him with a means of livelihood during that portion of the year when agriculture did not demand his attention.

The logging railroads have made accessible vast areas of timberland and provided a market for the forest products and agricultural produce of many communities, thus greatly increasing the earning power of the people. A large mileage of the trunk lines in some sections of the country were built originally as logging railroads, and had it not been for the activities of lumbermen these sections would be in a less prosperous condition than they are today.

A striking illustration of the good that may result from the activities of lumbermen is seen in the South, where in some sections, the commencement of logging and lumber manufacture marked the beginning of the awakening of the people from the lethargy into which they fell during the depressed periods attendant on and following the Civil War. Agriculture was at a standstill and the rural population, because of very poor transportation facilities, a dearth of animals for agricultural purposes, and the lack of funds for financing crops, had made no material progress. The lumber industry provided an occupation for many, furnished a large market for produce, and the logging railroads supplied a means of communication with the outside world. Further, the lumber industry created a demand for the timber growth of the region and what had proved a burden to many, because it encumbered land which might otherwise have been farmed, became a valuable asset. The criticism is sometimes made by those unfamiliar with former conditions that the timber buyers who purchased stumpage from local residents in the South took advantage of the owners and bought the timber at a

price far below its true value. It is a fact that many large areas were acquired from 12 to 25 years ago at what appears to be a very low price, when judged by present values. It must be remembered, however, that at that time yellow pine did not have the wide market which is open to it today, the main transportation facilities were inadequate and a great deal of the stumpage had very little actual value. The owners were glad to part with it on almost any terms, regarding it as an incumbrance on the land. Further, at that time a dollar had far greater value to the average land-poor resident of the rural communities than it has today, and in nearly every case the seller of stumpage which brought even a very low price felt that he had the best of the bargain.

Today, some of those who sold "timber rights" years ago which have not yet expired look with rather envious eyes on the high value at which timber is held. It should be remembered, however, that a large part of this increased value is due to the millions of dollars invested in the South by lumbermen who have made the stumpage accessible. Had it remained in the hands of the original owners, the lack of development of the region would have prevented the rapid increase in value which has occurred.

LUMBERMEN AND AGRICULTURE.

The lumber interests have played no small part in the agricultural development of the South, both through the market afforded for farm products, and also through demonstration farms on which the most approved methods of farming have been exhibited. The interest of the lumberman in this work has been two-fold, namely, to establish a market for his cut-over lands, and to encourage the production of agricultural staples, thus reducing the cost of such articles to him. Even today lumbermen find it necessary to purchase in outside territory immense quantities of hay, grain and other animal feed, and also the bulk of the foodstuffs consumed by their workmen. The South should produce this material and the

lumbermen are among the foremost in the movement for the development of the agricultural resources.

In the Northwest the prosperity of the country is, to a large extent, dependent on the activities of the lumbermen, for here the cutting of timber and the manufacture of lumber is the most important industry. A vast army of workmen rely upon the lumber industry for support; towns and villages have been built with funds provided directly or indirectly by lumbermen and vast areas of valuable agricultural and grazing lands have been made available to the settler, following logging operations.

It is impossible to consider any phase of development in this region without being forcibly impressed with the great work which lumbermen have done and are now doing.

While some may have accumulated large fortunes in the development of timberlands, we must not forget that they have left behind them many evidences of good done and generosity exhibited. The taxes paid by lumbermen have been used to build modern schools, court houses and other public buildings, and in some cases public-spirited men have contributed liberally to the support of educational and charitable institutions in various parts of the United States.

ADING THE COMMUNITY.

In many instances, especially in the South, lumber companies have been a distinct aid to the development of the community in which they operate by the efforts made to promote the immigration of desirable settlers to whom opportunity is afforded to acquire property on very favorable terms. One such instance is that of a large company in Louisiana which offers land to prospective settlers at a low price and on long time, with the added privilege of purchasing lumber at a cheap price and with several years in which to pay for the same. The farmers are aided in the development of cattle raising by an offer to dip free the animals that are brought to the dipping station maintained by the company. This enables

the farmer to eliminate, without cost, one of the most serious drawbacks to stock raising in the vicinity, namely, the cattle tick.

A free central market has also been established to which any farmer may bring his truck garden produce and find a ready market for it.

Practices of the above character are not uncommon in every region, although more highly developed in some instances than in others.

To the guiding hands of the lumber industry we owe the fact that the methods of forest exploitation are superior to those of any nation, due chiefly to the ingenuity and skill shown in the development and perfection of logging and lumber manufacturing machinery. The impress of our methods are now felt in every new country where virgin forests are being opened up on a commercial scale. In our own country the perfection of methods of exploitation has been one of the factors which has made available vast quantities of cheap building materials, and which has made the United States one of the foremost nations so far as home building is concerned. Without cheap lumber we would not now be in the front rank of the industrial world.

The American people in every section owe much to the lumberman for the part he has played in the moral uplift of the community. The large operators in every region are interested to a marked degree in the betterment of social conditions through churches, schools, clubs, etc., and in the enlightenment of the employees on questions of personal hygiene and sanitation.

In the South, for instance, where rural education is still in an undeveloped state, the lumber operators are doing much to secure better school buildings and to provide more and better instruction. The rural population in many sections has received a decided moral and mental uplift through the medium of these improved educational facilities and the religious advantages offered.

As an illustration of the interest in this subject may be cited the call which has recently been made by the Welfare

Committee of the Yellow Pine Manufacturers Association for conferences on welfare work. The topics to be discussed by experts and practical workers include community hygiene, safety and accident prevention, cost and value of emergency hospitals, wider use of public schools, savings and thrift, and other matters vital to the happiness and improvement of the lot of forest and mill workers and their families.

The lumbermen of the country, through their ownership of vast quantities of a natural resource, have had a great public responsibility thrust upon them, relating not alone to present but also to future generations. They have accepted this in good faith and are meeting the problems in the best way they know how, each year showing a marked advance not only in caring for and handling timber lands, but also in

bettering the social conditions of a very large number of people who are dependent on the industry for employment and support.

Intensive forestry has not and probably never will be practiced on the private timberland holdings of this country, if we may judge from the experience of European countries. There state and communal forests are relied upon for the production of successive forest crops. Our efforts, as citizens, interested in the forest problems of this country, should be directed toward encouraging and aiding private owners to protect and utilize their timber in the most conservative manner; and also to further the establishment and maintenance of public forests on which future generations may rely for their wood supplies.

IMPROVING YOSEMITE PARK

SECRETARY LANE, of the Interior Department, has appointed an Advisory Commission looking to the improvement of the Yosemite National Park, California. This commission will advise with the Secretary in matters relating to the care of the park, improve-

ments therein, its accessibility to tourists, and so forth. The commission will consist of Ex-Mayor James D. Phelan, of San Francisco; Mr. Noah Daniels, landscape gardener; Mr. Leslie Symmes, civil engineer, and Major W. T. Littebrant, acting superintendent of the park.

Eastern manufacturers are looking to the Northwest for hardwoods for the manufacture of clothes-pins. Birch is particularly wanted.

Washington stands first in lumber production, with Louisiana second.

Siam exports about \$9,000,000 worth of teak a year.

The forests of Florida contain 175 different kinds of wood.

There are seven spruces in the United States. Four are confined to the west; two to the east; while one, white spruce, has a continent-wide distribution.

Sawmill waste of Douglas fir, of which an enormous quantity is found in the Western forests, is being used to make paper pulp by a mill at Marshfield, Oregon.

In proportion to its weight, California redwood is the strongest conifer so far tested at the U. S. forest products laboratory. This strength is due to its long wood fibers.

The Philippine bureau of forestry reports that American and European lumbermen are trying to secure large and regular shipments of Philippine woods, mainly for cabinet making.

THE CONSERVATION OF THE NATURAL RESOURCES OF THE NATION*

A Study for Young Students

By HENRY STURGIS DRINKER, LL. D.,

President of Lehigh University, and President of the American Forestry Association

[No more important service to the cause of conservation can be rendered than to bring it to the attention of our boys and girls, and to impress its importance on them. The fire-circulars that have been distributed among the public-school children of the Northwestern States, and in Pennsylvania, Massachusetts, and North Carolina in the east, have done a world of good, and now we have the President of the American Forestry Association expounding forestry teachings to the schools in addresses of which the following is a type,—setting forth elementary forestry principles in a way to reach and interest the intelligent young student.—EDITOR.]

SOME years ago, while he was President, Colonel Roosevelt became impressed with the importance of awakening the nation to the necessity of taking better care of the stores of mineral, wood, and water, with which Nature has so bountifully endowed our country. The leader in the movement for the care of our forests, Gifford Pinchot, then United States Forester, at the head of the National Forest Bureau, was a close friend and associate of President Roosevelt, and his advice and knowledge had much to do with bringing about the awakening that came over the nation in this matter, in connection with the calling together at Washington by President Roosevelt of the Governors of all the States for a convention and conference with other leading men of the nation on this important subject. Out of this conference arose the National Conservation Congress, composed of delegates from the forty-eight States, appointed by the Governors of the States, and of delegates from the leading educational, scientific, and business bodies and associations of the country, which meets yearly in the autumn.

Now what is conservation? It has been well defined by Dr. C. W. Hayes, when chief geologist of the United States Geological Survey, as "Utilization with a maximum efficiency and a minimum waste." Don't let anyone persuade you that conservation, for instance in forestry, in our woodlands,

means the keeping of our trees uncut. It does emphatically mean the keeping of our trees uncut until the timber matures and is needed, but forestry as a science means the constant replanting, growing and cutting at maturity, of timber, for the nation's needs, and its teachings are directed to the doing this in the wisest and most scientific and economical way. There are, of course, many cases in which for scenic purposes, it is desirable to preserve grown timber uncut in our city, State and national parks, as for instance at the Crawford Notch in New Hampshire, and in private holdings, but this is the preservation of timber for an aesthetic, not an industrial purpose. What our nation is now concerned with is the fact that the woods with which America was so bountifully endowed, have been, and are being, rapidly cut for commercial purposes without proper provision being made for their re-growth, and they have been and are being negligently worked and wasted by burning from want of proper fire protection, so that experts predict that before long we shall have a timber famine, and that the need for widespread provision by the nation and by the States for replanting and careful re-growth of our forests is imminent.

The same profligate wasteful methods have existed in the mining interests of the country, and it is argued by some that the great sources of power in our streams and falling waters have not



AN EVIDENCE OF PROPER CONSERVATION.

This forest of spruce is near Oberndorf, in the Black Forest, Germany. It is 140 years old and worth over \$2,500 per acre for the timber crop, a far greater value than if it was farm land.

been conserved from private appropriation and utilized for the public benefit as they should have been, and that our potable waters should similarly be more carefully conserved for public use.

While our statesmen and politicians and the public at large have only recently awakened to the importance of these questions, it is interesting and a matter of pride to the engineering profession to remember that the engineers of our country long ago started to preach the need of conservation. So long ago as 1871, in May of that year, at a meeting of the American Institute of Mining Engineers, held at Wilkes-Barre, Pennsylvania, which I attended as a young engineer, a committee was appointed "to consider and report on the waste in coal mining," but it took many years for the lessons of our experts and engineers to take hold of the public on whom the results of needless waste would mainly fall. One of the most valuable discussions of conservation in recent years was that conducted in 1909 in New York by the four great engineering societies, the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical En-

gineers, and the American Institute of Electrical Engineers, to consider the matter of the conservation of our natural resources.

Today the clear understanding of what the conservation of our natural resources means, is one of the most important questions for our boys and young men to grasp. The day has gone by when men cut and burned valuable woodland growth, simply to clear it for farming, when the trees were looked on as an encumbrance and when our abundant coal was mined so extravagantly that no heed was given to waste. When it was forgotten, or unthought of, that our waters are for the many, not for the selfish use or profit of a few. The boys and young men of today are growing up in an age when they will find, on going out into life and life-work, that we have passed in our nation from the early stage of abundance, to the second stage when men see that great as are still the natural resources at our command, we must husband them to guard against that third stage that will not come in our day, but which surely will come unless intelligently provided against, when succeeding generations will suffer for want of things which



FOREST SCHOOL STUDENTS ACQUIRING A KNOWLEDGE OF PRACTICAL FOREST CONSERVATION BY LEARNING WHICH TREES ARE WORTH CUTTING AND WHICH ARE NOT.

we, their predecessors, may have negligently wasted and thrown away.

Now let us apply the study of conservation to our boys and to the young men of our schools and colleges. Today you are being trained in school buildings that are well ventilated and lighted. You sleep in well ventilated and appointed dormitories. You are provided with ample athletic grounds for recreation and exercise. The change from what was afforded in the past comes home to me when I look around my alma mater, Lehigh, and note what the students today have to make life healthful and pleasant as contrasted with what we had four or five decades ago. Today the great corporations of our land, employing large bodies of laborers, realize that to get the best work out of their men it is to their interest to see that the men are provided with good houses and healthful surroundings and that provision is made for amusement and open-air exercise. When visiting the Panama Canal in the au-

tumn of 1911, with a delegation of the American Institute of Mining Engineers, I had a marked instance of this, showing how our Government in the wise, broad conduct of that great work under Colonel Goethals has kept this principle prominently to the front. As I was journeying along the line one day in company with Major E. T. Wilson, the subsistence officer, one of the able men co-operating with Colonel Goethals in the great work, he turned to me and said: "After your return, I want you to send me down a couple of your Lehigh men, a mechanical engineer and an electrical engineer; but be sure that they are good baseball players, as well as well-trained engineers."

Now I had just inspected the eating houses and kitchens of the men, and had marvelled at the excellent way in which they were carried on, and had enjoyed the good food daily served to the working force: but here was a concrete demonstration that the wise broad policy directing the work, looked not

only to good results in work, but also looked to the development and maintenance of an esprit de corps fostered by careful attention to and promotion of the comfort and recreation of the working body. The day has happily come when a great national engineering work like this is run with an eye not only to cost and expedition, but with care, infinite detailed care, of the comfort, health and pleasure of the employes, insuring a spirit of contentment and zeal, highly conducive to good work, good morals, and good order. It was a great pleasure to me when revisiting the canal last spring, on meeting one of our mechanical engineering graduates, whom I sent down in response to Major Wilson's request, to find that he had not only made good professionally, but he showed me with pride a gold medal, attached to his watch fob, that had been awarded to him as catcher on the team which won the championship in the series of games between the different working sections on the canal.

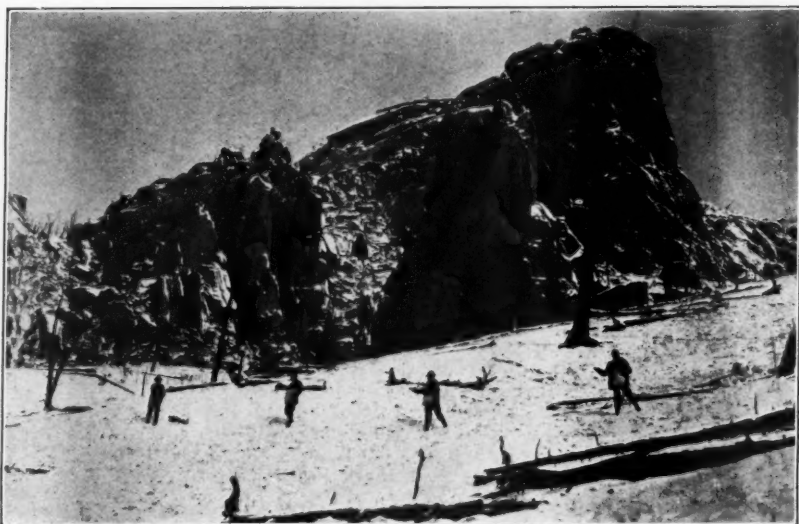
This is conservation of vital force. It is the same spirit of conservation that wisely encourages open-air sports

in our schools, colleges and universities, that is giving us in our girls strong, clear-eyed, self-reliant maidens, in place of the lackadaisical Clarissas, the heroines of the sentimental age of fiction, who fainted in emergencies instead of meeting them with womanly intelligence and strength, and that is giving us in our boys and young men—what we want in our glorious country—men in fact, well trained scholastically, and physically fit; taught that measure of self-restraint and self-reliance that well-managed athletics are certain to give. I believe in athletics that are promoted and encouraged for and by the entire student body—not in athletics that consist in the putting forward and worship of a gladiatorial few; in athletics that are compulsory on the whole student body, that are made a scholastic function and entitle the student to a fair measure of scholastic credit for performance, so that "Mens Sana in Corpore Sano" shall be a fact and not a fable in our youth. This is conservation of the youth of our land.

We owe also a duty of watchfulness to those self-sacrificing altruistic men, devoted to public service, who ably lead



REFORESTATION OF LAND IN THE PIKE NATIONAL FOREST WHICH IS OF LITTLE OR NO VALUE FOR AGRICULTURAL PURPOSES.



THIS LAND NEAR PUMA CITY, COLORADO, IS TO BE REMADE INTO FOREST LAND. FOREST RANGERS ARE SHOWN SOWING SEED ON THE SNOW.

great movements for the betterment of conditions among our people—men who are not only captains of industry, but generals in the army of public service, and leaders and exemplars in the pursuit of public duty. They become in leading these great movements, in a measure, the custodians of the public welfare, but “*Quis custodiet ipsos custodes?*” Who shall watch these very generals, and see that they conserve the intelligence, patriotism, and energy, that goes out from them to public welfare, that it may not be prematurely exhausted? Surely we should take measures to have them feel how the nation values them as a public asset, and how they owe it to their country as well as to their homes to heed and to preach to others the wise words of dear old Mark Twain, who (writing from Naples in 1867) sent us these words, pregnant with the lesson of the higher conservation of life:

“We walked up and down one of the most popular streets for some time, enjoying other people’s comfort and wishing we could export some of it to our restless, driving, vitality-consuming

mart at home. Just in this one matter lies the main charm of life in Europe—comfort. In America, we hurry, which is well; but when the day’s work is done, we go on thinking of losses and gains, we plan for the morrow, we even carry our business cares to bed with us, and toss and worry over them when we ought to be restoring our racked bodies and brains with sleep. We burn up our energies with these excitements, and either die early, or drop into a mean and lean old age, at a time of life they call a man’s prime in Europe. When an acre of ground has produced long and well, we let it lie fallow and rest for a season; we take no man clear across the continent in the same coach he started in—the coach is stalled somewhere on the plains and its heated machinery allowed to cool for a few days: when a razor has seen long service and refuses to hold an edge, the barber lays it aside for a few weeks, and the edge comes back of its own accord. We bestow thoughtful care upon inanimate objects, but none upon ourselves. What a robust people, what a nation of thinkers we might be, if



HERE IS TO BE SEEN A STRETCH OF CUTOVER FOREST LAND WHICH HAS BEEN RESEDED. NOTE THE DENSITY AND VIGOR OF THE NEW GROWTH. THE KIND OF FOREST CONSERVATION SO NECESSARY IN MANY QUARTERS OF THE COUNTRY.



IT IS PITIFUL TO KNOW THAT FOREST FIRES UNLESS THERE IS PROPER FIRE PROTECTION, AND SOMETIMES EVEN THEN, SWEEP THROUGH SUCH MAGNIFICENT FORESTS AS THIS IN OREGON AND CAUSE GREAT DESTRUCTION.

we would only lay ourselves on the shelf occasionally and renew our edges!"

Today the study of conservation is no longer a theory or a fad. It is recognized as a high duty pressing on all intelligent and patriotic men. Take the matter of forestry—the study of the proper use and reproduction of our woodlands. Its principles are being taught in the great schools of forestry maintained at so many of our institutions of higher education. There are today at least twenty-three schools in the United States with courses leading to a degree in forestry; ten with

courses covering one or more years in forestry, and thirty-four with short courses in forestry.

There are many associations, national and local, devoted to the study and teaching of forestry, all of them, from the American Forestry Association down to the smallest local society, unselfishly devoted to the promotion of a great national work. I know of no profession more ideally beautiful than that of the young forester, living and communing with nature in the great woods—but to live this life the young man turning to it must feel the natural vocation or calling for the woods. He

must have the innate love of the woods that speaks in Douglas Malloch's words, where the old woodsman says:

"There's some of us has this world's goods,

An' some of us has none—

But all of us has got the woods,

An' all has got the sun.

So, settin' here upon the stoop,

This patch o' pine beside.

I never care a single whoop—

Fer I am satisfied.

Now, take the pine on yonder hill;

It don't belong to me;

The boss he owns the timber—still,

It's there fer me to see.

An', 'twixt the ownin' of the same

An' smelling of its smell,

I've got the best of that there game,

An' so I'm feelin' well.

The boss in town unrolls a map

An' proudly says, "It's mine,"

But he don't drink no maple sap

An' he don't smell no pine.

The boss in town he figgers lands

In quarter-sections red;

Lord! I just set with folded hands

An' breathe 'em in instead.

The boss his forest wealth kin read

In cent an' dollar sign;

His name is written in the deed—

But all his land is mine.

There's some of us has this world's goods,

An' some of us has none—

But all of us has got the woods,

An' all has got the sun!"

Today thirty-four of the forty-eight States of the Union have State forestry organizations of some kind, and twenty-nine States are making annual appropriations for forestry administration, fire protection and forestry interests; those made in 1912 varied from \$500 in one State, up to \$224,550 in New York, and \$321,750 in Pennsylvania, in addition to which Pennsylvania made large appropriations for fighting the chestnut blight, just as Massachusetts has done for fighting the brown-tail moth. Thirteen States have set aside

State forests ranging in extent from 1,950 acres in Maryland, to as high as 982,337 acres in Pennsylvania, and 1,644,088 acres in New York. In addition to this we have the great national forest reserves, which, according to the last published report of the United States forester, Mr. H. S. Graves, who succeeded Mr. Pinchot, cover in gross area, in twenty States, 160,591,576 acres, in addition to which there are 26,748,850 acres set aside in Alaska and 65,950 in Porto Rico, a total of 187,406,376 acres set aside as national forest reserves, and these national forests are shown to contain an estimated total of 600,000,000,000 feet of merchantable timber.

Remember that forests properly cared for and protected, not only yield us timber for building, but they conserve and regulate our water supply. The rains fall and run off in torrents from bare denuded hillsides, but when the rain falls in a forest it is caught and held in the mossy soil, the humus, whence it feeds the springs and streams with gentle even flow, and gives a well regulated water supply instead of alternating flood and drought.

I have tried thus to give you some idea of mining and forest conservation. Those of you who develop into engineers, will soon learn of the great problems connected with the conservation of our water supply. Remember that though our coal as a source of heat, light, and power, must in time be exhausted, our streams will still run, and that they are a never-ending and economical means of developing heat, light, and power, through the development of electric energy, and in this direction the doctrine of conservation teaches that the storing back by dams of the flood waters of our streams must be so managed that it shall be done so as to accomplish the greatest good for the people at large—that our streams are apparently the magazines of power of the future, and indeed are rapidly becoming potent agencies of the present for ministering to our comforts and our needs.

These are the main doctrines of conservation—the care and conservation of

life, and the conservation of our natural resources, which should not be locked up for the needs of future generations to the exclusion of the needs of the men of today—but which we should learn heedfully so to use as not to waste them, but to develop them in accordance with the wise maxim of Dr. Hayes above quoted, that “Conservation is utilization with a maximum efficiency and a minimum waste,” or as Mr. Frederick S. Titsworth, of Denver, puts it, “True conservation is the enlargement of the use and prevention of the abuse”—and it is the coming duty of the trained young men of America, of the students of today, who will be the citizens of tomorrow, to see to it that our national heritage of minerals, of woods, and of waters, is not wasted, but wisely conserved and used for the good of the nation. Do not, however, be led astray by the diatribes of demagogues or the teachings of extreme enthusiasts and allow yourselves to be made to believe that because great developments require large capital, the result is necessarily monopolistic or

contrary to the best interests of the country. As has been well said, our western country was never settled and never could have been settled, with thirty cents and an infant class, and the country owes a deep debt of gratitude and appreciation to the great interests that have led in our transportation and industrial development. “The conservation problem today is largely one of public policy, limited by the Constitution and the law of the land.” It is a tremendous question, worthy of the best thought in our land, and it is one on which our young men should be led to think, as a matter vital to the prosperity of our country, full of interest and importance to their life future—a service at once great, unselfish, and patriotic, well epitomized where in Sophocles’ Oedipus it is said:

“Methinks no work so grand
Hath man yet compassed, as, with all
he can,
Of chance or power, to help his fellow-
man.”



FOREST STUDENTS IN A VIRGIN WESTERN YELLOW PINE FOREST IN COLORADO
ARE MARKING THE TREES WHICH ARE TO BE CUT.

PRODUCTION OF LUMBER, LATH AND SHINGLES

A PRELIMINARY statement of the output of lumber, lath, and shingles in the United States during the calendar years 1912, 1911, and 1910, was issued a few days ago by the Director of the Census, William J. Harris. It was prepared under the direction of William M. Steuart, Chief Statistician for Manufacturers, by Jasper E. Wheelchel. The data were collected, as for several years past, in co-operation with the Forest Service of the Department of Agriculture. The publication of the statistics for 1912 over four months earlier than for the preceding year gives them additional interest and value.

On the whole, the showing for the past year indicates improved conditions in the lumber industry. Although the total reported cut was slightly less than in 1910, the average yield per mill was 5.3 per cent greater than in that year, while the total production over 1911 was 2,155,207 M feet board measure, or nearly 6 per cent. In view of the fact that it was a presidential election year, the degree of activity in the lumber industry during 1912, as reflected by the figures, is especially noteworthy, the output exceeding that of four years earlier—1908—by nearly 6 billion feet board measure, or 17.9 per cent.

EDUCATIONAL NOTES

Prof. C. H. Goetz, who for the last three years has been connected with the Department of Forestry of the Ohio State University, has accepted a position on the faculty of the Colorado School of Forestry, at Colorado Springs, Colo. Mr. Goetz was graduated from the forestry course of the Michigan Agricultural College in 1907, and spent the following year in post-graduate work at the University of Michigan. He then entered the Forest Service, from which he was soon called to take charge of the forestry course at the Washington State Agricultural College, at Pullman, Wash., and after holding that position for two years was called to the Ohio State University. During his summer vacations Mr. Goetz has traveled extensively for the purpose of studying forest conditions and lumbering methods in different parts of the country, and in the summers of 1909 and 1910 acted as fire warden for the Washington Protective Association in the Cascades.

The State College of Forestry at Syracuse finds that 47 counties of the State are represented in its student body at the close of registration; nine States outside of New York are represented. Three Chinamen,

who expect to return to China to practice forestry, have registered in the first and second years. With the senior class of the College of Forestry yet to register, there are represented in the student body of the college 47 of the 61 counties of the State and 9 States other than New York. The total number of students in the college at the present time is 203, divided as follows: Freshmen, 121; sophomores, 62; juniors, 20.

Nine States of the Union in addition to New York State are represented as follows: Connecticut, Massachusetts, New Jersey, Pennsylvania, Vermont, Virginia, Minnesota, North Carolina, Wisconsin.

Immediately following the registration of over 200 students in the State College of Forestry at Syracuse the student body organized a Forestry Society for the purpose of getting closer together as a student body and for the debates and original discussions upon various phases of forestry in New York and throughout the country. I. A. Williams, of Virginia, was elected president; A. G. Smith, of Rensselaer County, secretary; A. V. S. Pulling, of Dutchess County, treasurer, and C. V. Sweet, of Oswego County, J. H. Rich, of Onondaga County, W. I. Galligher, of Broome County, executive committee.



CHARACTERISTIC POSITION OF DROOPING LEAVES ON
BLIGHT KILLED SHOOTS OF CHESTNUT TREE, SHOW-
ING ALSO A SMALL BUR.

THE BLIGHT IN PENNSYLVANIA

By OLIVER D. SCHOCK

ALTHOUGH Pennsylvania has taken the lead in forestry conservation, the commonwealth having secured by purchase over 100,000,000 acres of mountain and other timberland since 1897, it faces an unexpected crisis at this period in consequence of the rapid and certain decimation of its vast number of valuable chestnut trees from the effects of the deadly chestnut tree blight.

Whether nature will be willing and able to resume its former equilibrium to control and eradicate the disease is very uncertain, and can best be regarded as an improbable proposition: one that is not at all safe as a financial

consideration, since both nature and science have thus far not been able to control this parasitic fungus in its sure and determined work of destruction.

Those who are familiar with the chestnut blight report that extensive traveling throughout southern, eastern and central Pennsylvania shows that the fungus is perhaps even more virulent than in the preceding year. The early spring months were deceptive, as many trees donned luxuriant foliage and appeared to have in at least a measure, recovered from the effects of the previous infections. Later developments proved the fallacy of these expectations, as many of the



A BLIGHT CANKER ON A BRANCH SHOWING CHARACTERISTIC SWELLING AND CRACKING OF BARK ON YOUNG WOOD.

trees are now either entirely dead or almost completely destroyed by the blight.

With the discontinuance of the active work of the Pennsylvania Chestnut

Tree Blight Commission, because of an insufficient appropriation, there loomed up a new condition. Timber owners are now solely dependent upon their own resources in their efforts to



OLD LESION IN WHICH THE BARK HAS BECOME SOMEWHAT SHREDDED AND THE WOOD EXPOSED. THE BRANCH HAS BEEN DEAD FOR A YEAR.

check the advance of the pest. As the case stands, their only source for obtaining advice and friendly encouragement will be through the medium of the National Department of Agricul-

ture and the State Forestry Department.

The problem as to how to replace chestnut, and especially on the denuded mountain and forest lands, is a



FAN SHAPED MYCELIUM FROM BARK OF A ROUGH BARKED TREE.

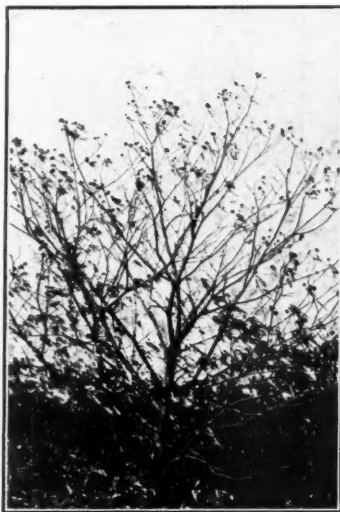
complicated and difficult one to solve. Where isolated or individual trees were killed, evergreens or rapid growing hardwood trees are being substituted. Others advise the planting of nut bearing trees, such as the black and English walnut, claiming that these will be found desirable and profitable. Still others pin their faith and money upon the successful cultivation of pecan

trees, since it is an established fact that some varieties are sufficiently hardy for this latitude. In other instances the cultivated varieties of chestnut trees supplant our sweet, American chestnut which yielded so rapidly to *Diaportha parasitica*. It is true that certain trees are more resistant to the blight than other varieties, but thus far none have proven immune.

A Lehigh County nut enthusiast planted over 1,000 Paragon chestnut trees last spring, with the result that while the loss from the blight was inconsiderable, a protracted drought killed nearly one-half of the trees. These will be replaced by trees of the same kind.

Those who plant for nuts, profit and pleasure, believe that walnut trees of our native growth will show the best results financially. Many farmers could add to the value of their farms by a systematic planting of nut trees along fences and in spots where they would not interfere with other trees and plants. Walnut lumber commands almost fabulous prices, and there is no indication of lower values. The best and most conclusive evidence that nut tree growing is in the ascendancy was made patent by a visit to the Lehigh, Berks, Lancaster and York County Agricultural fairs during the past month. There was a greater representation of nuts of all kinds exhibited than ever before in the history of these old organizations. The display at the

Lancaster fair was especially noteworthy for its size, variety and excellence.



ORCHARD CHESTNUT TREE INFECTED BY THE BLIGHT.

FORESTERS ANNUAL BAG

DURING the past fiscal year 4,686 predatory animals were killed by Federal officers on the national forests, according to an actual count of carcasses. An indeterminate number of animals, whose bodies were not found, are presumed to have died from poison.

The ranger's bag of beasts of prey this year, as shown by Forest Service figures, was made up of 206 bears, 3,541 coyotes, 133 mountain lions, 62 lynx, 583 wild cats, 64 wolves, and 97 wolf pups. The figures indicate that the national forests are becoming cleared of wild animals that prey upon domestic livestock and game, for the forest ranger fills in odd domestic moments between other jobs by thinning out "undesirable citizens" of the animal world.

Wolves are said to cause greater losses to western stockmen than any other of the predatory animals. It is

estimated that a family of wolves will destroy about \$3,000 worth of stock per annum, and that one able bodied individual costs the grazing industry \$600 a season.

The wolves are of two classes—the smaller prairie wolves or coyotes, and the larger grey, black, or timber wolves, called "lobos." These latter are the great stock destroyers against which the campaign of the rangers has been waged.

The methods of hunting wolves in the West vary. On the plains wolves are sometimes hunted with dogs and horses, but this way is considered expensive and often dangerous. This sport is described by Roosevelt in his earlier hunting books. On national forests the rangers either set out poison or baited steel traps or, by watching trails and hiding near a wolf's den, are able to shoot one or both of the old wolves when they return from

foraging. In no other way, according to the Forest Service, can the number of wolves be kept down so well as by finding their dens and destroying the young.

The skins of the predatory animals killed by the rangers are either kept as souvenirs or sold for a price or for bounty. Wolf skins in the West are said to bring from \$4 to \$6 for robes and rugs; a mountain lion skin, \$10 to \$20, and a bear skin, anywhere from \$20 to \$150, according to size and species. In addition to this there are

bounties on bear, lions, and wolves in most of the western stock States. Wyoming, in ten years, has paid out, it is said, over \$65,000 in bounties on wolves alone and \$95,000 more on coyotes and mountain lions.

Through his activity against these pests, the forest ranger, it is said, has saved the stockmen many thousands of dollars during the year, while the protection to game animals, such as deer, elk, and antelope, is of almost equal importance.

MR. PACK'S RE-ELECTION

BY NORMAN C. McLOUD

THE unanimous re-election of Charles Lathrop Pack as President of the Conservation Congress came as an evident surprise to him. It occurred when he had gone away from the Convention Hall for luncheon. Many of the delegates knew it would be difficult for Mr. Pack to serve another year owing to other duties which he regards as sacred trusts, and when informing him of his election they urged him not to decide the question of the Presidency at present but to give it further consideration in deference to the wishes of the majority of the delegates. This he agreed to do, and he will act at least until the affairs of the Fifth Conservation Congress are closed up. There are many details to look after, as the attendance of delegates at the Washington convention was very large. More than five thousand regular accredited delegates were appointed in answer to the Official Call.

The forestry work, as evidenced by twelve printed reports in pamphlet form prepared under the direction of the Forestry Committee of the Conservation Congress, is considered by forestry experts and lumbermen to be the best work that up to this time has been done for American forestry and lumbering. Mr. Pack is greatly interested in this work which he inaugurated, and it will mean much for the cause if it can go forward under his experienced direction.

The convention insisted on the election of Charles Lathrop Pack as a recognition and approval of the fair, able and impartial manner in which he has conducted its affairs.

WHAT THE CONSERVATION CONGRESS ACCOMPLISHED

BY CHARLES LATHROP PACK

President of the National Conservation Congress

AMONG the fourteen hundred delegates present in Washington at the Fifth National Conservation Congress were more foresters than had ever heretofore attended any similar meeting in this country. The forestry work accomplished, as evidenced by the twelve printed reports in pamphlet form prepared under the direction of the Forestry Committee, is considered by forestry experts and lumbermen to be the best work that up to this time has been done for American forestry and lumbering. These results alone would justify all the effort that has been made and the presence in Washington of such a representative body of men.

The adoption by the Conservation Congress of the recommendations unanimously presented by its Committee on Water Power was a long step forward in the development of a definite governmental policy, recognizing clearly the principle of Federal control; and also recognizing clearly the necessity of offering to the investor opportunity to invest his time and money in the development of water power under conditions which safeguard both the public interest and his investment.

The Committee on Water Power comprised ten men, exceptionally qualified by knowledge of this subject in all its aspects. Under the able chairmanship of Dr. George F. Swain, President of the American Society of Civil Engineers, it worked out and presented not a mere declaration of principles, but concrete and specific recommendations which should be of great value to the Government in framing the legislation that is needed to convert the present comparative inactivity in water power development into a period of active Conservation by use.

The fact that a committee comprised, not only of professional experts of the highest distinction, some of whom are actively associated with the water power interests, but also such men as ex-Secretary Stimson, Mr. Gifford Pinchot and Mr. Lewis B. Stillwell were able to agree upon a definite and constructive program, and that this program received the emphatic endorsement of the Conservation Congress, is a demonstration of the public spirit of the Committee and the ability of the Congress to accomplish effective and constructive work. All true Conservationists will hope that our National Government will promptly enact the legislation that is so greatly needed.

FORESTRY AT THE CONSERVATION CONGRESS

AT no one period in the history of this country have there been together at one time so many foresters as assembled in Washington for the forestry conferences in connection with the Fifth National Conservation Congress, on November 17 and 18. Almost every State in the Union was represented, as were all of the provinces in Canada where there is any forestry organization. The men comprised employees of the Forest Service, of State forestry departments or commissions, of State organizations, and fire protective associations, and with them were many other members of the American Forestry Association deeply interested in forest conservation.

They came to hear the reports of the Forestry Committee of the Fifth National Conservation Congress, and its ten sub-committees, and the discussions upon these reports. Each report was printed as a separate pamphlet, and these were distributed at the meetings. They were generally declared to be the most valuable contribution to forestry literature that has appeared in some time, dealing as they do with various phases of forest publicity, Federal forest policy, State forest policy, forest taxation, forest fires, lumbering, forest planting, forest utilization, forest school education and forest investigations.

The discussions on these reports, in which some of the leading forestry experts in the country participated, were of great value in bringing out additional features of the subjects with which the committees dealt, with the result that there has rarely been crowded into two days' time as much forestry instruction as was derived during the six forestry section meetings.

Chief Forester Graves presided at each of the six sessions. In order to save time, none of the reports were read in full, but the chairmen of the sub-committees discussed in more or less detail the chief features of each, and as those present had the oppor-

tunity of reading the printed report, they were primed for continuing the discussion after the subject was presented. So important were the reports, so ably were they prepared and so fully did they delve into the features of each condition which the committees had selected for investigation, that it was apparent the two days allotted did not provide all the time that was really necessary for discussion, this time having been so arranged that the foresters could attend the main session of the Congress in order to hear the addresses on forestry subjects and the talks on water power.

The conclusion reached by every one present was that the work of the committees had proved of such far-reaching value and widespread interest that it is a prime necessity, for the good of the forestry cause, that the work of forestry committees on similar lines should be continued from year to year.

It is possible to say now that this will be done. The plans for doing it are not complete; the money for conducting it is not in sight, but the intention to carry on the investigative work is beyond doubt.

The American Forestry Association secured the \$5,000 needed during the past twelve months to pay the expenses of the committees and to publish the pamphlets, and it worked actively with the Forestry Committee of the Congress in the effort to make the work of the committees the success which it proved to be.

In order to give the publicity it deserved to the reports of the committees, a special number of *AMERICAN FORESTRY*, devoted exclusively to a synopsis of each committee's report, was published, and this was distributed not only to all the foresters but to the delegates at the main Congress, and was sent free of extra charge to every member and subscriber of the Association. It will prove of much service in referring to the main features of each report.



THE FORESTRY BANQUET ON THE NIGHT OF NOVEMBER 19, 1913. MR. CHARLES LATIROP PACK, PRESIDENT OF THE NATIONAL CONSERVATION CONGRESS, PRESIDING.

EDMONSTON
PHOTO
WASHINGTON
D. C.

The reports in full, each in pamphlet form, may be secured by application to the American Forestry Association. They have been prepared with such care, and present such a thorough study of the forest conditions under investigation, that they furnish facts and conclusions of the greatest value to not only every one making forestry a profession but to every one interested in any phase of forestry or lumbering. It is apparent that they are to be in great demand, and that there will be an insistent request from all who see them that similar work be carried on from year to year.

The Conservation Congress will publish a limited number of these pamphlets, together with a synopsis of the discussions on each subject, in book form within a short time.

Before the main congress the forestry addresses made a deep impression. Henry S. Drinker, president of Lehigh University and President of the American Forestry Association, presided at the forestry section of the Congress on Thursday, November 20, and addresses were made by Henry S. Graves, Chief Forester, on "Federal Forestry Work"; by E. T. Allen, Forester of the Western Forestry and Conservation Association, on "Public Knowledge of Forest Economics"; by E. A. Sterling, secretary of the Forestry Committee, on "Private Forestry Work"; by William Irvine, of Wisconsin, on "The Attitude of the Lumberman Towards Forestry"; by J. E. Rhodes, secretary of the National Lumber Manufacturers' Association, on "The Lumberman's Point of View," and by Miss Mabel Boardman, who spoke on "Conservation in the Lumber Camp." There was a very large attendance at each of these meetings, and the delegates were apparently much impressed with what they heard.

THE FORESTRY BANQUET.

A special feature of the gathering of foresters was the banquet given on Wednesday evening to the foresters and at which Mr. Charles Lathrop Pack, the re-elected president of the Congress, was made a most happy toastmaster. Over three hundred foresters and lumbermen were present, and, in

addition to an excellent dinner, they enjoyed a number of addresses, all of which sounded a decided note of optimism in speaking of the future of the forestry movement.

Secretary of the Interior Franklin K. Lane made a notable address. He said in part:

"I am identified with forestry in different ways because, I suppose, in the first place, I have the management of a stretch of forests altogether amounting in value to some \$100,000,000 worth of timber which our friends, the red men, have today. I do not know how long they will have it. The very type of watch that some of you gentlemen keep on the national forests inclines me to believe that some of the predatory gentlemen who have been reaching out for some of the national forests in the past, might attempt to lay their hands on some of these Indian forests, and I am trying to keep very close watch on some of them.

"I come also from the big tree State, and I notice in the audience some gentlemen who are from that same State, and, of course, we can let no opportunity like this pass without calling your attention to the fact that we are from that State which produces the largest trees ever produced.

"If I had been in the habit of gambling in forest lands or in lumber or in stumpage, it would have taken me a long time to become accommodated to this system that you gentlemen have set up. (Applause.) There are some institutions in the east that you gentlemen have the advantage of in the way of gambling that we do not have out West, and when you advance policies which seem to take away from us our living, and many of those forms of entertainment which are more important to us than living, we certainly are justified in raising a protest and letting you know that there is a part of the country the other side of the Missouri River. I was out there this summer, and I want to say a frank word to you. You gentlemen who are national foresters are in the same employ that I am: we are both working for the same people. I happen to get a little more money, perhaps, than some of you, but

that does not change the difference in our relationship, it makes no difference whether you are a forester and I am a member of the cabinet or not, you have the same high purpose that I trust I have, which is to serve the people of the United States as well as possible. (Applause.)

"I have complaints in my department, and you foresters are not altogether free from blame, and I am talking to you as I would talk to you if you were my own men and I would put in to you the same spirit that I am trying to put in to my men. Government does not consist of a set of rules. The best and most beneficial government that ever was created, the finest constitution that ever was written, the most magnanimous set of institutions that ever were founded, can be made unpopular to the last degree by the kind of way in which they are forced upon people or enforced under the law. You and I have a duty to perform, a serious duty, and it is not to govern arbitrarily, it is not to do our work so rigidly and with such an assumption of authority that we will be offensive. The greatest problem that statesmen have is the problem of humanizing government (applause), of making men realize that these things that are being done are being done, not wilfully, but out of a desire to do good, and if the people cannot see that good will come, then in our hearts we must have the feeling that it is because their imagination is not quite as good as ours, that they cannot see how this beneficent purpose will work out.

"The problem of government is the problem of human relationship. Not any two men can get into an argument upon an abstraction that will make relationship between them impossible, and all society of today consists in the ability of one man to get along with another. The men who cannot get along with others are not outlaws. Modern society is made up of those who have learned to understand the viewpoint of the other fellow. That is the basis upon which the village was formed, the basis upon which the larger group, the State, was formed, and the basis of the Nation today. You hear constant talk of co-

operation; larger and larger grows the movement for co-operation, not helping ourselves alone, but helping the other fellow; each one of us is conscious now that he is, in a sense, his brother's keeper, and what does this co-operation mean? It means that we are approaching the lot in which the other man is cast, we are understanding how he feels and how he looks upon the problem of life, and I say to you, my fellow public servants, if you will allow me to be so diadetic at a dinner, that we have one great problem, and that is to see from the other man's standpoint and not for one moment allow him to think that the thing that he does comes out of a premature order from a bureau in Washington. The West does not like the sound of that word "bureau." We must decentralize, as far as we can, our administration, putting more and more responsible men into places that are removed from their home center and make those people feel that they are not being governed arbitrarily by men who are imported to govern. I hope that that word sinks into your hearts and out of it will come a purpose and a determination on the part of some to make more intelligible, more rational and more sympathetic, the great administrative work that you and I have to do.

"It is always a pleasure for me to talk with men who are interested in these problems that we have begun so lately to work out. Why, it is only within the last few years that there have been any real problems, aside from those that the lawyers could dispute about. We have only just begun to take advance steps and to make a movement in the direction of improving our fortunes by conserving our own resources and developing them, but your boy and mine will see that develop into a great question. If we can go abroad and spend four hundred million dollars in a ditch between two seas, it would not appear to be preposterous twenty years from now to spend five times that amount on some great national enterprise. (Applause.)

"Within ten years, I believe, and probably earlier than that, a man will be able to step on a car in Washington and within a little more than a week

land in Fairbanks or Nome, Alaska, without stepping from that car. We have work of that magnitude that stimulates our imagination.

"The conservation of your forest lands is only a beginning in the great work that can be undertaken by the people of the United States in making this a living place, not for 90,000,000 people, but for 190,000,000 people. The work that you are engaged in is a national work and not for today, but for all time, and while our names may never be known in history we at least can have this conscience, which is the proudest one that a man can have, that we are doing work not for the shekels that it brings in, but out of a desire to make the fellow who comes after a bit happier."

EX-SECRETARY FISHER

Former Secretary of the Interior Walter L. Fisher, after a witty reference to the strenuous day he had as presiding officer at the Congress, went on to say:

"There are a good many things I have in my mind, but I made a real speech at your luncheon last January about what I was really most interested in saying at a forester's meeting.

"There were some things that occurred during the debate today which I might refer to. I tried not to take any more part in the proceedings than an impartial presiding officer should, but it struck me at the time that it was a most remarkable thing, and it has always struck me that our friends from the West cannot see the point of view of those who hail from the territory which lies east of the Mississippi, and especially that which lies on the Atlantic Slope, the point of view about the West where they were given resources to handle for themselves, and not repeat the mistakes in the West that were made in the East. But there are a few concrete points which, perhaps, would penetrate even their understanding. We are spending in the East today something like eleven million dollars—I think this was the original appropriation—for the purchase of land in the Appalachian forests for the purpose of protecting the water sheds of naviga-

ble streams. Every acre of that land that has passed into private hands has been exploited and handled from the forestry point of view in such a manner as to jeopardize the future of vast areas. We are buying it back today, we are buying it back after the timber has been cut, at prices largely based upon its prospective value for the growing of another crop of timber in the somewhat remote future. Out in the Western States it would seem to be the part of wisdom that we should not part with that kind of land to private interests for the mere sake of enabling them to cut the timber so that we may buy it back from them, because the same processes that we have gone through here we are going to go through there. How much wiser it would be if we were to sell the timber, permitting it to be cut under proper and reasonable restrictions, and retain the land itself for reforestation. It seems to me, it is axiomatic that it is difficult to understand why anybody who has any intelligent conception of the value of forestry and water sheds, could be at all in opposition to it.

"There are only one or two places where we have undertaken to do anything affirmatively to protect water sheds solely from that point of view. I believe that in California we have one reservation created by act of Congress for the sole and express purpose of protecting a valuable water shed for one of the largest municipalities and communities there, but, in general, the reservation we have made in the national forests is the only successful and real attempt that has been made to protect the future of those water sheds in the West. It has seemed to me that there is one thing in connection with these national forests that perhaps ought to receive more public attention. It has been a great pleasure to me to know the increasing attention which it has received from the Bureau of Forestry itself.

"I refer particularly to the use of the National Forests as playgrounds for the people, their use not simply for the protection of the timber, but by the construction of appropriate roads and trails, their use for camping purposes,

their use as great recreation grounds for an increasing body of the American public that wishes to go out into the open under the trees and under the sky. It seems to me that much can be done in that direction and that it will prove a growing demand and will strike a responsive chord in the public. I have been greatly delighted to find that the Forestry Bureau is increasingly emphasizing that part of the usefulness of these forest areas.

There is very little else I could say to you tonight. The work of the foresters and of the Forestry Bureau, not only of the nation, but the forestry organizations in the different States, is, to my mind, one of the most important departments of governmental administration, and I am delighted to see tonight so many men representing that exceedingly important work."

There was much applause during Mr. Fisher's speech. Toastmaster Pack then called on E. A. Sterling, a director of the American Forestry Association and secretary of the Forestry Committee. Mr. Sterling said in part:

THE FUTURE OF THE WORK.

"On behalf of the Forestry Committee, and in connection with its work, I want to say a few things briefly and in a very serious vein. The work of those men in connection with lumbering and forestry, so far as I know, is new. We have had lumbermen's associations, we have had forestry associations, we have had various gatherings, educational and otherwise, but we have not to any great extent gotten together in a serious way to work out definitely, so far as our knowledge and ability goes, the semi-typical problems which are the basis of a whole lot of our conservation work today. I think this work, which perhaps is only a sample, creates first a closer relation between the lumbering end, the timber game and the more theoretical forestry end. In the good old days when Mr. Pinchot used to send us out to see what we could do in connection with big problems about which we knew very little, we perhaps failed to do what was expected of us because we did not know,

and the whole subject was new to the men whom we were trying to help. Even when the work was first started, there was an interest and a desire to do something in forestry, but neither the men who owned the forests, nor the younger men who were trying to help in their conservation and better management, knew as definitely as they might just what they ought to do. Ten or twelve years has brought a great change in our work and in the commercial business; it has matured the men who are trying to work out these problems and particularly brought out, I think, a feeling and a realization that the so-called forester is a practical man. He was called a theorist then, but today, through the settling down of conditions, I believe we are at a point where the timberland owners and the foresters can work together to a great advantage to both, and it is through the national organization that much of this detail work can be handled. Why do we need this, and what should we do? In a word, we have before the country and before us as individuals a number of specific problems; we have taxation, we have fire protection, and we have various other things which are being worked out by individuals, by corporations and by bodies national and private. No matter how good the work may be that these individuals or corporations may do, it has been difficult to get together and exchange views and approach anything like a standard. To be sure, we cannot standardize a great many things as yet, but we can bring together the things which we know are right, and, with this as a basis, develop year by year a policy which will be accepted and which will work out for the good of all. The work of the foresters and the theorists—I speak of them with a great deal of respect, for they know what they want to do—has reached a point where they can reach the commercial problems to bring about the greatest help in the application of their principles on the ground.

"I want to say that in our brief experience within the last nine or ten months, in a new line of work, in a work which has required voluntary

effort on the part of men who are busy with other things, that the results and prospects seem fully to justify a continuation of this work. There are lots of precedents to follow, and I think we should work along the line of standards of some of the older organizations, for instance, the International Congress of Applied Chemistry gets together periodically. The manufacturing chemists, corresponding to the operating timber men, and the pure scientific chemists meet, consult and standardize things that are of interest to all. Why can we not do the same thing? If we can get together every year, why can we not standardize semi-technical problems which are of interest to all?" (Applause.)

THE AMERICAN FORESTRY ASSOCIATION.

Mr. W. R. Brown, of Berlin, N. H., a director of the American Forestry Association, spoke for the Association. He said:

"In our northern camps every evening there is posted over the door of the men's sleeping quarters a scale slip which denotes the amount of work done that day by each crew in the camp. This slip is eagerly awaited and carefully read; it is sometimes discussed, in vigorous language, but it has a real value, because it keeps the men up to their work. The boss looks it over and awards according to its account.

"Now we present the American Forestry Association to you in the light of that scale slip. Mr. Ridsdale, who gets out our magazine, keeps the scale for you who are the workers. He keeps it in good form and tries to give a good account, but he is doing more, he is try-

ing to furnish an open forum for the intelligent discussion of all the aspects of forestry; he is looking for the truth, as you are. Secretary Lane said at the beginning of this conference that it was the principal business of most honest men to be seeking the truth. The American Forestry Association feels that criticisms and suggestions have a great place, that they improve methods. The American Forestry Association has at the present time over 7,000 members. It has established itself on a firm financial basis, it is reaching the public through its magazine and through sending its representatives to other associations throughout the country, and it has co-operated with this Conservation Congress in the development of scientific work of value. It would do more of this work, and it feels the need of and has the desire for a trained forester to go about through the country as a field worker. It also feels the need of a liberal endowment and a permanent home.

"Gentlemen, the American Forestry Association is proud to welcome you to this Conservation Congress and to this dinner; it congratulates you on the work which you have carried out year by year, and it solicits your earnest support in carrying on the investigation and the portrayal of that which is true, which is just, and which is of scientific value in the administration of our forests. It asks your co-operation in the trusteeship which comes to all of us in a more or less extent in the carrying on of our private operations for the good of the nation as a whole." (Applause.)

Other addresses will appear in the January number of AMERICAN FORESTRY.

Canada cuts about 2,000,000 cords of pulp wood annually, about half of which is exported for manufacture in the United States.

It is claimed that some of the eucalypts of Australia are taller than the California red-woods, hitherto considered the highest trees in the world.

There are 55 oaks in the United States, about evenly divided between the East and the West. The Eastern species and particularly white oaks are the most valuable.

A TREE WITHOUT A MALE PARENT

WITHIN the last two years a remarkable extension of the field of reproduction among higher forms of plants without the aid of the male has been made by Dr. Robert T. Morris, the well-known surgeon of New York City, in his experimental work at his nut farm in the northern part of Stamford," says the *Guide to Nature*. "A large part of Dr. Morris's experiments has been devoted to the production of hybrids—that is, to the result of mingling the male element of one kind of plant with the female of another kind. To do this he must, of course, limit the transfer of the pollen. He must apply it just where he wants it and must take the pollen from one kind of tree and put it on another. Dr. Morris found after he had covered certain tree flowers with a paper bag to prevent the haphazard mixing of the pollen, that the trees produced plants without waiting for him to place on them the pollen of a cross-plant to produce a hybrid. At first he thought that he must have been careless in isolating pistillate flowers from all pollen. Then he repeated the work with check experiments and found that a nut was act-

ually produced without the intervention of the male element.

Some fifteen months ago he planted a sprouted parthenogenic butternut that has now grown to a height of thirty-seven inches with a spread of thirty-nine inches. It sprouted about the first of May of last year, and it is now aged fifteen months and is many times as large as an ordinary butternut of the same age, subjected to similar conditions. Some of the parthenogens produced by Dr. Morris are smaller than an ordinary butternut of the same age. This curious feature of disparity of size belongs also to parthenogens of other species of trees and plants in Dr. Morris's collection. The accompanying photograph shows this interesting butternut that might well in popular terms be called "a tree without a pa" and yet has been produced by the ordinary method of growing from the nut and not by budding. So far as we know this is the first parthenogic tree that has ever been photographed. In the picture is shown Dr. Morris at the left explaining his wonderful production to Mr. Frank A. Bartlett, of Stamford, Connecticut, the well-known expert in arboriculture.

The bureau of forestry of the Philippine Islands will send tropical timbers to the U. S. forest service so that their suitability for fine furniture veneers may be ascertained.

Wood block paving, tried and discarded in many cities of the United States thirty years ago, is now coming back into marked favor, due to improved methods of treating and handling the blocks.

German foresters are experimenting with Douglas fir from the United States trying to find a variety which will combine the fast growing quality of the Pacific Coast form and the hardiness of the Rocky Mountain form.



MOST REMARKABLE BUTTERNUT TREE—A PARTHENOGEN—THAT IS, IT HAD NO MALE PARENT.

The first ever known and the first photograph ever taken of this. Height, 37 inches; spread, 39 inches; age, 15 months.

SLIGHT LOSS IN WASHINGTON

By E. W. FERRIS, *State Forester and Fire Warden.*

THE amount of standing merchantable timber killed by forest fires in Washington during the year will not exceed 1,000,000 feet, and that actually destroyed will not amount to more than \$700 in the 23 timbered counties which come under the jurisdiction of this department. Furthermore, all of the timber that was killed will be logged, and hence no loss on that account.

There were 10,430 burning permits issued, covering 85,000 acres of agricultural and 27,000 acres of logged-off land, as compared with 7,048 permits in 1912, covering 20,862 acres of agricultural and 20,707 acres of logged-off land. The expenses of the season, which includes per diem and expense of wardens, federal patrolmen and the cost of fighting fires, amounted to \$14,527.66, as against \$18,336.27 last season.

The season of 1913 was a record-breaker, and there were many things which helped make it such. The weather conditions were quite favorable in a portion of the counties, while in others no rain of any consequence fell for a period of seven weeks.

The people generally did a great deal to bring about the success of the season. They are becoming more careful each succeeding year, and are desirous of complying with the law in every partic-

ular. It is very gratifying to the department to know that they are cooperating with us to such an extent.

The Washington Forest Fire Association, and all of its officers, supervisors and rangers, did everything within their power to assist the State Department, and are certainly entitled to very, very much credit for the results. Likewise, everyone in the employ of the U. S. Forestry Department put forth every effort to render every help within their power. Indeed, it is most gratifying to know how well all of the departments and associations engaged in the work of forest protection are working together in this State.

The different protective departments and associations will hold several meetings between now and the beginning of the closed season of 1914, for the purpose of getting even closer together and making our work more effective.

The newspapers throughout the entire State did excellent work in cautioning the people to exercise care during the dry season, and in continually publishing matters that were of great assistance to us. And we feel very grateful to them.

The loggers, millmen and railroad companies rendered very material help, in the way of safeguarding their equipment, and using the utmost care in carrying on their work.

SOUTH DAKOTA FIRE LOSSES

By GEO. W. ROOKIE

State Forester

THE forest fire season for 1913 opened early, with conditions extremely favorable to large fires. Owing to continued dry weather in the fall of 1912, the small amount of snow throughout the winter, and the lack of early spring rains, the

grass and litter on the forest-floor was dry as tinder. Almost incessant winds added greatly to the danger, both in further drying out the ground and in fanning into flame sparks and embers that would otherwise have died out.

Under these conditions forest fires

were anticipated as a certainty, and, in fact, were of almost weekly occurrence. The only fire of any consequence, however, on the State Forest lands was one on the Custer Forest, starting April 15th and burning until April 18th, requiring the combined effort of nearly 500 fire-fighters to control.

This fire started from a settler on the edge of the Harney National Forest burning straw. The high wind prevailing at the time carried the light material over onto the inflammable grass and needles of the forest and started a ground fire that was beyond the efforts of anyone at hand to control, and which in an incredibly short time sprang into a crown-fire terrific heat and velocity.

Impelled by the strong wind, this fire spread rapidly and threatened at one time to not only destroy thousands of acres of valuable timber, but to run from the foot-hills out onto the prairie and wipe out the surrounding towns. It was exceedingly difficult to control owing to the excessive heat developed and to the rapidity with which it traveled, and was only finally surrounded and checked by hard and continuous fighting on the side-fire, and by back-firing.

The loss to the State in this fire was about 600 acres of valuable yellow pine, valued, together with the reproduction and grazing, at approximately \$22,000; the cost in pay to fire-fighters and transportation and subsistence was \$1,100. The loss to the United States was considerably more than this. It is interesting to note, in this connection, that the settlers who were responsible for this great loss were found guilty of criminal carelessness and adequately punished.

The summer fire-season was normal, late spring rains having given vegetation a start and relieved the extreme conditions of the spring. The usual number of lightning-fires occurred throughout the season, but they were all discovered and controlled before they had gained headway.

A comprehensive Fire Plan was inaugurated on July 1st, and 60 per cent of the details of the plan were completed this season. The completed work included several miles of telephone line built and in operation, a lookout station established and equipped on Sheep Mountain, the highest point on the forest, elevation 6,000 feet, and the building of a tower and cabin for the watchman. This lookout has direct telephone connection with the district ranger and with Forest Headquarters, and with the lookout on the Harney National Forest through Custer central. The building of new trails, repairs and work on others, and the purchase and distribution of fire tools and equipment was also effected this season.

The State Forest Service was able, along with other activities, to effect the necessary fire patrol up to September 15th, when the money available for the two patrolmen engaged was exhausted and their work ceased. This would have been a serious condition had not the application for Federal aid under the Weeks Law, previously made, been acted upon favorably by the Forest Service. This timely assistance was of the utmost importance, as it permitted the retention of the two patrolmen for the balance of the normal fire-season.

From the standpoint of forest fire protection the early fall season has been very favorable, there occurring considerable moisture, which, coming at regular intervals, together with late frost, has kept vegetation green beyond the usual time. It was not deemed advisable, however, to dismiss the patrolmen, as the normal fire-season does not close until well into November, and a few warm days aided by brisk winds would soon dry out the needles and dead grass and again make conditions serious. The patrolmen have been kept engaged on other fire protection work, such as trails, lookout construction, brushing, etc., and will be retained until November 15th.

RESOLUTIONS ON FORESTRY

THE resolutions referring to forestry and adopted by the Fifth National Conservation Congress are as follows:

Deploing the lack of uniform State activity in forest work, we emphatically urge the crystallization of effort in the lagging States toward securing the creation of forest departments with definite and ample appropriations to enable the organization of forest fire work, publicity propaganda, surveys of forest resources, land classification and general investigations upon which to base the earliest possible development of perfected and liberally financed forest policies.

We recommend in all States more liberal appropriations for forest fire prevention, especially for patrol to obviate expenditure for fighting neglected fires, and the expenditure of neglected fires, and the expenditure of such effort in the closest possible co-operation with Federal and private protective agencies; and also such special legislation and appropriation as may be necessary to stamp out insect and fungus attacks which threaten to spread to other States.

Since Federal co-operation under the Weeks act is stimulating better forest protection by the States, we urge annual appropriation by Congress for its continuance.

We recommend simplifying and shortening the process of purchasing land under the Weeks act.

We recommend that the Federal troops be made systematically available for controlling forest fires.

We recommend the work of the Federal Forest Service in protecting and improving the forest resources under its control, also in developing better

methods of forest utilization, and urge our constituent bodies and all citizens to insist upon adequate appropriations for such work and to combat any attempt to break down its efficiency.

Holding that conservative forest management and reforestation by private owners are very generally discouraged or prevented by our methods of forest taxation, we recommend State legislation to secure the most moderate taxation of forest land consistent with justice and the taxation of the forest crop upon such land only when the crop is harvested and returns revenue where-with to pay the tax. We call attention to the recent adoption of such systems by several States.

We appreciate the increasing support by lumbermen of forestry reforms and suggest particularly to forest owners the study and emulation of the many co-operative patrol associations which are doing extensive and efficient forest fire work and are securing closer relations between private, State and Federal forest agencies. Believing that lumbermen and the public have a common object in perpetuating the use of forests, we endorse every means of bringing them together in mutual aid and confidence to this end.

Recognizing the practical constructive work which has been done by the Philippines Bureau of Forestry, we urge that no change be made in jurisdiction or policy which would result in any setback to forestry in the Philippines.

We recommend the holding of expositions in various parts of the country which demonstrate the vital importance of maintaining our forest resources and which will more fully educate the public to the manifold uses of forest products.

FOREST NOTES

The Bureau of Entomology through its Branch of Forest Insects under the charge of Dr. A. D. Hopkins, has been conducting experiments with woods treated by various methods to determine how they may be protected from injury by our native white ants. Experiments are also under way to determine the immunity or relative resistance of various native and tropical species of untreated wood to white-ant attack.

The specialist in charge of these experiments has submitted a report on the treated and untreated woods, which have been submitted to attack from white ants for from 5 to 12 months. Yellow-pine stakes charred by burning for about five minutes were attacked at the end of one year, and this treatment only delays attack. Yellow-pine stakes impregnated by the "open-tank" method with coal tar and wood creosotes; dipping and brush treatments with wood and coal tar creosotes, and stakes treated by two closed-cylinder pressure processes with several different creosote compounds were not attacked at the end of one year. Untreated alternating check stakes were attacked by white ants.

An examination of test blocks showed that after being buried in the ground with infested logs for nearly six months, some of the blocks impregnated with paraffine wax were attacked by white ants, while wood treated with chlorinated naphthalene was not attacked. Untreated teak, greenheart and peroba test blocks—all tropical woods—were not attacked, while untreated white and red oak, sugar maple, birch, and red gum were attacked and more or less seriously damaged.

The provincial parliament of New Brunswick, at its session last winter, provided for a survey, examination, and classification of the Crown Land areas of the Province. The report, as provided in the Act, is to cover the

following points: the character and quality of the lumber; the quantity of timber and the reproductive capabilities of the various areas, estimating as accurately as may be the annual growth of the timber upon each area or tract; the accessibility of the timber in each section; the cost of logging the different areas; the cost of steam-driving to the point of manufacture, and the location of the lands deemed suitable for agricultural purposes. Owing to financial considerations, it was not considered practicable to create a separate organization and provide for the collection at first hand of this very important information on an extensive scale. The existing staff of cruisers and scalers has therefore been charged with the duty of collecting and compiling, under the supervision of Mr. W. H. Berry, superintendent of scalers, all available information along the above lines. The provincial government feels that, in this way at least, the great bulk of the above information can be collected to an extent sufficient for present needs, and consistent with financial considerations.

In furtherance of his policy of strengthening the administrative work of the Bureau of Indian Affairs, Secretary Lane has requested the Secretary of Agriculture to approve the transfer of Mr. Franklin W. Reed, a Forest Inspector in the Indian Service, at a compensation of \$3,600 per year.

Mr. Reed has been connected with the Forest Service for ten years, and received his training at the Biltmore Forest School. He has been a Forest Inspector for the last three years and is eminently qualified by experience and training to be Forester in the Indian Service.

The discovery of what is believed to be the oldest tree in the Fourth Forest District has been made by E. H. Hodson, in charge of the forest inves-

tigations, who has returned to the headquarters here after spending two months in the Payette, Weiser, and Boise national forests of Idaho.

While on the trip the investigator discovered a yellow pine which has attained the age of 459 years. This veteran tree was found in the Carpenter Creek district of the Payette forest.

The new regulations for Dominion Forest Reserves, which recently went into force, make full provision for the grazing of live stock on such reserves as frequently contain considerable areas of grass-land. The method to be followed is similar to that in successful operation on the National Forests in the United States. The number and kind of stock to be admitted into each reserve is determined each year by the Director of Forestry according to the capacity of the reserve.

The total cut of lumber in Canada in 1912 was 4,389,723,000 feet, board measure, valued at \$69,475,784, which production represents a decrease of 10 per cent from that of 1911. There was a greater or less decrease in each province except Saskatchewan, where dur-

ing 1912 the cut increased by 16 per cent, 99 per cent of the lumber there produced being spruce. Ontario still leads the provinces in lumber production, cutting 31.6 per cent of the total. British Columbia makes a close second, and, as its percentage production is increasing, while that of Ontario is falling off, the position of these two provinces may possibly be reversed in the report for 1913.

State Forester J. E. Barton, of Kentucky, in accordance with an agreement reached some time ago, whereby the State and Federal Governments are to divide the expense of maintaining a patrol service in the forest district of eastern Kentucky, has announced that the following will act as county wardens:

James Winn, Witt, Estill County; James H. Mays, Sandy Hook, Estill County; E. P. Rader, Foxtown, Jackson County; G. B. Lyttle, Barbourville, Knox County; Hardin Lutes, Primrose, Lee County; E. H. Dunn, Hyden, Leslie County; S. S. Cassity, Morehead, Rowan County; David Stephens, Salversville, Magoffin County.

BOOK REVIEWS

THEORY AND PRACTICE OF WORKING PLANS, by A. B. Recknagel; John Wiley & Sons, New York, 1913; pp. 235, Ill.

This book is primarily intended as a textbook on the subject of Forest Organization, and supplies a real need in American forestry. The only previous text in English, Schlich's Manual, is a translation covering European practice in a highly theoretical manner. Owing to the extreme differences between conditions in America and Europe, and the advanced state of forest organization in the latter countries, it has been difficult for American foresters to avail themselves of the experience of older countries and the subject of working plans and forest regulation has been regarded askance as something for which we were as yet unprepared.

In a concise and lucid manner the author presents a complete digest of the principles and practice of working plans, selecting from a mass of detail those principles and facts which have a direct bearing upon American practice.

Chapter I reviews the basis for working

plans, describes the attributes of the reve-nue forest, and summarizes the methods of collecting data by reconnaissance and the determination of the methods of treatment under the heads of Unit of Regulation, Silvicultural Methods of Management, Object of Management, and Rotation. The author confines himself to a brief outline of these points.

In Chapter II a valuable contribution is made to our knowledge of Regulation of Yield, a subject upon which the successful management of permanent forests largely depends. Seventeen methods of regulation are presented and a clear exposition is given of their adaptability to American conditions. The most interesting part of this chapter is the description of methods in use for regulating abnormal and uneven-aged forests in Austria of a type similar to the majority of our western national forests. With this text as a guide it should be possible to intelligently plan practical regulation of yield

on any forest. The sections on distribution of yield which deal with plans for allotting the annual cut, and on regulations of yield in special cases, are directly applicable to the problems confronting the managers of large tracts of virgin timber.

In Chapter III the principles previously outlined are formulated into a Working Plan Document, containing the proper headings necessary for the application of the plan.

Part Two contains a digest of the present practice of working plans in the six principal states of Germany, and in Austria and France. From this can be seen the present tendencies in these countries, the past mistakes which can be avoided, and the elements which have stood the test of practical application in countries where the production of timber as a business has long passed the experimental stage.

The final chapter deals with American practice and describes the development of the knowledge and practice of working

plans by the Forest Service. The distinction is clearly drawn between preliminary plans and the more specific plans possible where economic conditions permit of the proper utilization of the timber. A complete outline is given for a working plan suited to the management of a forest whose area and character permit the development of all the uses of forest land as timber production, grazing and agriculture.

The book is to be commended for its brevity, omission of superfluous details and for the completeness with which it brings out the connection between principles and practice. The experience of the author in the Forest Service has enabled him to sift from the mass of information at his disposal the kernels of fact and to avoid fruitless discussion of what would be for our conditions unpractical schemes. The book should serve as an acceptable text for instruction in the subjects which it covers.

H. H. CHAPMAN.

STATE NEWS

Pennsylvania

Mr. Frank L. Harvey, of Foxburg, Clarion County, has been appointed by Governor Tener as a member of the State Forestry Reservation Commission to fill the vacancy caused by the expiration of the term of Miss Mira L. Dock.

The Commission held a meeting on October 3d at which twenty-six of thirty-seven applications for permanent camp sites upon State Forests were approved. The Commission also passed a resolution providing that the children of the State be granted the free use of the State Forests as recreation ground, subject to the few reasonable and necessary rules for the protection of the land itself, and urging upon them the use of this land for all proper purposes, particularly for mineral and plant study, the collecting of wild flowers, the study of bird and animal life, the gathering of chestnuts and other wild nuts and fruits, and the enjoyment of such pleasures as are incident to the life of a child in nature's great out-of-doors.

All forest officers have been instructed to afford every reasonable facility in their power to the children in their respective neighborhoods, for the enjoyment of the privileges conferred, and of which the children are freely invited to avail themselves.

Colorado

Conservation of the natural resources of the State, along the lines of the Government plan, is the great question in Colorado today. It does not break in noisy, stormy white caps on the surface of the sea, but is evident in a heavy undertow that breaks now

and then upon the shore. So far as conservation relates to forestry, a large majority of the people of the State are with and for the Forest Service; but to some politicians, a few corporation lawyers and certain big interests "Conservation" is a "red rag."

It was hoped by them that Secretary Lane, who was here recently, would, at some point during his stay, endorse the movement to have the public domain, within its limits with all its resources, including the National forests, turned over to the State.

To pave the way and make it easy for the Secretary, the Governor, in introducing him to the people attending the banquet given by the Denver Chamber of Commerce, as good as promised that he, the Secretary, would declare himself as ready to assist them in the endeavor. As a speaker he is affable and full of sunshine. During his address, in his courteous and most winning way he took occasion to say that, aside from the reserves, there are 19,000,000 acres of public domain open under the law for all kinds of occupancy, exploitation and development. To those not familiar with the facts, who are made to believe that the Government has locked up everything, so that no open opportunity remains, this was news and a surprise. To the close observer it is apparent that the work of the Forest Service is being more and more appreciated.

Michigan.

The annual meeting of the Michigan Forestry Association was held October 24th at Muskegon. The attendance of members was not large, but the meeting was decidedly profitable. In the morning the business meeting transacted routine business, accepted re-

ports of the Treasurer and Secretary, and elected officers for the coming year. In the afternoon a joint session was held with the State Federation of Women's Clubs.

The Secretary reported that the petition to Governor Ferris has received no public recognition by him, but its good effect can not be doubted since a bill creating a non-partisan Public Domain Commission and a competent State Forester with power to act was prepared, previous to the last meeting of the legislature. The bill was submitted to U. S. Chief Forester Graves, Gifford Pinchot, State Forester Cox, of Minnesota, and Griffith, of Wisconsin, and other foresters of national reputation, and had received their strong support. The bill was introduced in the Senate by Senator King, of Alma, and was referred to the Committee on Forestry and State Lands, of which the Honorable H. E. Powell, of Ionia, was chairman. In spite of the valiant efforts of Mrs. Francis King, of Alma, the bill was allowed to die in committee, and in its place, a bill approved by the Public Domain Commission was passed. The latter bill appropriated generously, but made none of the changes in the system for forest protection or in the Public Domain Commission which the Association had persistently urged as being necessary for any real efficiency. The amount of support brought out by the Association bill, in spite of its final failure, doubtless has resulted in impressing on those in charge of State forestry work the necessity of showing results in the very near future.

The Secretary reported that his office had carried on extensive correspondence with many individuals and associations desiring information concerning forestry in this and other States, and that Professor Roth and others had contributed articles and news notes aggregating in excess of 25,000 words, publication being secured without cost to the Association.

The Secretary reported that the assistance rendered by various organizations and individuals had been invaluable, and especially the work done by Mrs. Francis King, in advocating the Association bill at Lansing, and by Mrs. L. L. Maurer, of Saginaw, chairman of the Forestry and Conservation Committee of the State Federation of Women's Clubs, in interesting the clubs in forestry and securing their support for the measures advocated by the Association.

The following officers were nominated and elected for the coming year:

President, John H. Bissell, Detroit; Vice-President, Professor Filibert Roth, Ann Arbor; Treasurer, Wm. B. Mershon, Saginaw; Secretary, P. S. Lovejoy, Ann Arbor.

Directors: Hon. Chas. W. Garfield, Grand Rapids; Hon. Junius E. Beal, Ann Arbor; Mrs. Francis King, Alma; Dr. Lucius L. Hubbard, Houghton; Henry G. Stevens, Detroit; Wm. H. Anderson, Grand Rapids; Mrs. L. L. Mautner, Saginaw; R. D. Graham, Grand Rapids; Mrs. W. S. Wood,

Muskegon; Benjamin Wolf, Grand Rapids; E. A. Stowe, Grand Rapids; Mrs. Edith C. Munger, Hart; H. N. Loud, Au Sable; John W. S. Pierson, Stanton.

The meeting adopted resolutions, among which were these:

The Association deplors the action of the Public Domain Commission in not supporting, but rather opposing, the measures recommended to the last legislature, particularly the provisions: (a) Law for a State Forester; (b) for a satisfactory forest fire law and organization.

The Association strongly maintains that a non-political competent, trained and experienced State Forester is a necessity in our forestry development.

The Association deplors also the action of the Governor, who, in spite of numerous petitions, did not see fit to make any recommendations regarding one of the most important material interests of the State.

The Association views with deep concern the continuance of the unsatisfactory conditions in our State land and forest affairs, notably: (a) The large areas of idle lands; (b) frequent forest fires without any adequate organization to prevent or fight them; (c) the rapid decrease in the number of our wood-working industries; (d) the large and growing imports of timber into the State; (e) the rapid disappearance of supply of native timber; (f) the absence of any co-operation between the State and timber owners; (g) the increase in price of lumber to the point where it hinders home building; (h) the fact that all our planting thus far would not keep our saw mills running for a single hour.

The Association is glad to see that the Public Domain Commission is at last changing its policy and that it has stopped the sale of public lands.

The Association strongly recommends the further increase of State forest reserves, and is glad to see this line of action being taken up by the Public Domain Commission.

The Association tenders hearty thanks to the State Federation of Women's Clubs for the excellent work which it has been doing, and which gives promise of rapidly changing the public sentiment in favor of forestry in every county.

New York.

The Burd-Merritt amendment to the forestry clause (Article 7, Section 7) of the State Constitution, having passed two State Legislatures, was submitted to the people at the recent election and was adopted. The present constitution prohibits any physical use of the forest preserve. The developments of water power and establishment of storage reservoir in the Adirondacks has been under discussion for several years. The forest preserve on account of its wide distribution prevented nearly all of these developments owing to the constitutional prohibition. As a result of careful examina-

tion, it was determined that a majority of these projects could be affected by the use of not to exceed three per cent of the forest preserve. The use of that amount of State land, subject to State control, was incorporated in this amendment which has been adopted.

The annual meeting of the State Federation of Women's Clubs was held in Buffalo on November 12, and an address on forest fires was given by C. R. Pettis, Superintendent of State Forests.

The annual meeting of the Empire State Forest Product Association was held in New York City on November 13. Several papers of wide interest were given. Mr. Frank L. Moore, President of the Association, referred to the non-use of State land and the possible advantages which might accrue if the constitution permitted. Professor Nelson Brown, of Syracuse University, referred to the better utilization in wood manufacture. Mr. Samuel H. Ordway gave a very interesting paper on forest taxation. Mr. Otto Van Norden, of the Camp Fire Club, discussed the proposed forest legislation. Mr. C. R. Pettis, Superintendent of State Forests, pointed out loss of revenue to the State through the failure to utilize the growth of timber upon State land, leasing camp sites and sale of isolated parcels of land outside of the Adirondack and Catskill Parks. Professor H. P. Baker, of Syracuse University, gave an illustrated lecture at the forestry banquet in the evening. Professor Moody, of Cornell University, discussed the Wisconsin Forest Fire Law.

California.

During November a new protective association was organized in California. Realizing the value of organized effort to prevent and suppress forest fires the residents of Applegate, a community in Placer County, requested the State Forester, G. M. Homans, to assist them in drawing up a plan of organization. Mr. Homans assigned this work to A. W. Dodge, State Forest Inspector, and an investigation was made after which the association was fully formed. During the past summer months fires occurred frequently in this section of the low Sierras and large tracts of brush and timber land render the fire problem a serious one. Considerable territory is represented by the present membership; the aim is to expand in area and membership as soon as the work gets well under way. A working plan will be prepared by the State office recommending the construction of fire-breaks, trails and the placing of tool caches. The name adopted by the new organization in the Placer Forest and Home Protective Association. The members of such a protective body are in a position to more readily receive county and State recognition than they would be as separate individuals; they are able to do more than protective work alone. By united effort and valuable State assistance in the form of sug-

gestions from the State Forester a community may accomplish much in the way of road improvements and planting.

There are five protective associations of this character now active in California and it is expected that the movement will steadily advance; most favorable results have been obtained. The State Forester stands ready to assist in every way possible any community desiring to organize for the purpose of forest improvement and fire protection. The fire season for 1913 has passed, but it has been a serious one in California; several lives have been lost, and the lesson teaches us perhaps never before that organized and systematic control alone can adequately prevent and suppress forest and range fires.

The State Board of Forestry has just issued an attractive bulletin with reference to street and highway planting.

Pennsylvania

The forester in charge of the Clearfield County nursery, established in the spring of 1911, having an area of 4,800 square feet of bed surface, reports having an inventory of over one million seedlings made up of red pine, white pine, Douglas fir, and Norway spruce. 500,000 of these will be available for planting in the spring of 1914. The complete inventory of the other foresters has not yet been received, but we have every reason to believe that the department will have close to ten million seedlings for planting next year.

The recent legislature permitted the Department of Forestry to lease permanent camp sites within the State forests. As a result of applications received during the last two months something over 35 leases have already been signed. The lessee pays a small annual rental for a site which must not exceed two acres in extent. He must guarantee that he will, in no way, contaminate the springs or streams in the neighborhood of his location. Assistance is expected in the matter of prevention and extinction of forest fires when a member of his household or his party is occupying the site. Temporary or permanent buildings may be erected and telephone lines may be built. Any building, however, which is erected is to be at the service of any forest employee in time of emergency.

At the beginning of the deer hunting season the Department had issued 785 permits to camp upon State lands, which is in excess of the number granted last year. This means that between five and six thousand people will have camped upon State lands during the year 1913.

For a number of years the Department of Forestry has recognized the fact that efficient service on the part of its employees calls for satisfactory living conditions, and every effort within its means is taken to make its foresters and rangers more or less comfortable. On many of the tracts purchased there have been buildings of various kinds and in

various conditions. Where any of these buildings could be remodeled satisfactorily, such work has been done, and wherever houses have been repaired, barns have also been repaired, or, in their absence, new ones built. This last month has seen the completion of a forester's house in Tioga County. Previous to this time the Department has built for foresters or rangers eight new houses. These houses are made just as convenient as they can possibly be made with the surrounding conditions as they are. In nearly every instance provision is made for water to be piped into the house. In one of the houses to be built this coming spring it is possible that electric wiring will be done so that the forester may make use of the electricity available from a neighboring electric plant. On most of the State forests old cabins have been repaired or new ones built in places where rangers have long patrol routes.

Kentucky.

The organization of the fire protective work under the cooperative agreement between the United States Department of Agriculture and the State Board of Forestry of Kentucky is going forward. The danger season for fire is at present on us and the fires have already started in Eastern Kentucky. The appointment of fire wardens under the agreement has been confined to the eastern part of the State at present, since this is the mountain section where the heaviest timber in the State is. Fourteen fire wardens have been appointed and as fast as other suitable men are found appointments will be made in the counties where the work is most necessary. In connection with this work, every effort is being made to get the timberland owners interested in the proposition and in some counties, it appears to me, cooperation of this character will be forthcoming. In Bell County the timberland owners have already indicated the disposition to cooperate with the office of the State Forester in this work. In Rowan County a meeting of the large land owners will be held on November 10 to take up the proposition of a cooperative association for the protection of the timberlands of the county. The Consolidation Coal Company, which has large holdings in Letcher, Johnson and Floyd counties, has also stated that they will be glad to cooperate with the office of the State Forester in this character of work. The Consolidation Coal Company has a forester to look after their own timber holdings, and it seems that cooperation with this company will prove valuable. In an effort to bring forest extension work before the boys and girls of the State, the State Board of Forestry recently approved the plan for the formation of boys' and girls' forestry clubs throughout the State. This work will be undertaken with the earnest

cooperation of the State Department of Education. The main feature of these clubs will be the planting of small plantations of fruit and nut trees by the members of the club. Information will be furnished by the office of the State Forester with regard to grafting, budding, spraying and other work of this character, and annual prizes will be offered for the best fruit and nuts produced. With this as a ground work, it is intended eventually to extend the operations to plantations of forest trees solely; but in order that the work may be practical and that results may be obtained by members of the clubs within a comparatively short number of years the work in the beginning has included fruit and nut trees. The Annual Report of the State Forester is now in the process of compilation and will be published about the first of the year. Fall work in the State Nursery established at Louisville is going forward, and it is expected that next spring a large number of additional seed beds will be added to the present number.

South Dakota.

The season just drawing to a close has been one of especial activity on the State Forest Lands. The first appropriation for administration of State Forests became available July 1st and with many projects to initiate, as well as sales, fire-protection and other forest activities to carry on, the State Forest Service has had to maintain a strenuous pace.

Grazing and special and free use cases have been taken up and disposed of as rapidly as possible to give time to special projects. Several miles of telephone lines have been built connecting ranger stations and lookouts with Forest Headquarters; trails established and blazed, and a complete fire-plan, including Weeks Law assistance, put into operation. Wide use is being made of the free-use privilege accorded to settlers within the vicinity of the forests.

A sale of 5,000,000 feet of yellow pine on Rapid Creek has been laid out and mapped for cutting this winter, and a logging area figured to include the sale now being advertised of 25,000,000 to 50,000,000 feet on Squaw Creek in the Custer Forest. The Ranger in charge of the Harding Forest has been kept busy with the grazing, special use, hay sales, small timber sales and free use on that tract.

In addition to the regular forest activities the Custer Forest of 60,000 acres is being enclosed with an 8-foot game-fence, the construction of which is under the supervision of the Forest Service. Approximately, 45 miles of posts have been cut, the forest boundary cleared and 10 miles of posts set from July 1 to date. It is expected that the fence will be completed by the winter of 1914. We are assuredly "some" busy on the State forests.

CURRENT LITERATURE

MONTHLY LIST FOR NOVEMBER, 1913.

(Books and periodicals indexed in the Library of the United States Forest Service.)

Forestry as a Whole

Proceedings and reports of associations, State forest officers, etc.

Massachusetts—State forester. Ninth annual report, 1912. 108 p. pl. Boston, 1913.

National conservation congress—Forestry committee. Report of the forestry committee; program of the forestry section; forestry committee organization; synopsis of subcommittee reports. 14 p. Wash., D. C., 1913.

St. Petersburg—Lyesnoi institut. Izvestiya (Contributions), v. 24-25. pl. St. Petersburg, 1913.

Forest History

Hausrath, Hans. Die geschichte des waldeigentums im Pfälzer Odenwald. 65 p. Karlsruhe, C. F. Müller, 1913.

Forest Aesthetics

Street and park trees

Morrison, Ben Y. Street and highway planting. 119 p. il. Sacramento, Cal., 1913. (California—state board of forestry. Bulletin no. 4.)

Newark, N. J.—Shade tree commission. Ninth annual report, 1912. 67 p. il. Newark, N. J., 1913.

Forest Education

Arbor day

North Carolina—Supt. of public instruction. Civic days; good roads; arbor day; compiled for use in the North Carolina public schools, Nov. 6, 1913, by the North Carolina geological and economic survey. 46 p. il. Raleigh, N. C., 1913. (Bulletin 22.)

Forest Schools

Briscoe, John M. Extension course in forestry. 4 p. il. Orono, Me., 1913. (University of Maine—College of agriculture—Extension dept. Timely helps for farmers, v. 7, no. 1.)

North Dakota school of forestry. Seventh annual catalogue, 1912-1913. 54 p. il. Bottineau, N. D., 1913.

University of Michigan—Dept. of literature, science and the arts. Announcement of the course in forestry, 1912-1913. 34 p. Ann Arbor, 1913.

University of Washington—College of forestry. Announcement; practical short courses in forestry and lumbering, 6th session, 1914. 4 p. Seattle, 1913.

Forest Legislation

International institute of agriculture. Annuaire international de législation agricole, v. II, 1912. Rome, 1913.

Forest Description

Campbell, Roy L. Turtle mountain forest reserve. 20 p. il. map. Ottawa, 1912. (Canada—Dept. of the interior—Forestry branch. Bulletin 32.)

Clothier, George L. A report on the recruise of about fourteen thousand acres of timber land belonging to the agricultural college and scientific school grants, made under authority of the act approved February 11, 1899. 20 p. Pullman, Wash., Washington state college, 1912.

Forest Botany

Trees; classification and description

Arnold arboretum. Bulletin of popular information, No. 51. 4 p. Jamaica Plain, Mass., 1913.

Switzerland—Inspection fédérale des forêts. Arbres et forêts de la Suisse, troisième série. 18 p. il., pl. Berne, 1913.

Silvics

Jaccard, Paul. 1. Accroissement en épaisseur de quelques conifères en 1911 et 1912; 2. Ruptures de cimes provoquées par la surcharge des cônes. 20 p. Berne, Impr. Büchler & Co., 1913.

Forest Protection

Leavitt, Clyde. Forest protection in Canada, 1912. 174 p. pl., map. Toronto, Canada. Bryant press, 1913.

Insects

Herrick, Glenn W. Control of two elm-tree pests. 24 p. il. Ithaca, N. Y., 1913. (Cornell university—Agricultural experiment station. Bulletin 333.)

Patch, Edith M. Aphid pests of Maine; pt. 2. Willow family. 25 p. il., pl. Orono, Me., 1913. (Maine—Agricultural experiment station. Bulletin 213.)

Fire

Holmes, J. S. Forest fires in North Carolina during 1912, and national and association co-operative fire control. 63 p. Chapel Hill, N. C., 1913. (North Carolina—Geological and economic survey. Economic paper no. 33.)

Forest Economics*Statistics*

Canada—Dept. of the interior—Forestry branch. Forest products of Canada, 1911. 73 p. Ottawa, 1913. (Bulletin 37.)

Lewis, R. G., comp. Forest products of Canada, 1912; lumber, square timber, lath and shingles. 67 p. diagr. Ottawa, 1913. (Canada—Dept. of the interior—Forestry branch. Bulletin 40.)

Forest Utilization*Lumber industry.*

Bryant, Ralph Clement. Logging; the principles and general methods of operation in the United States. 590 p. il., map. N. Y., John Wiley & Sons, 1913.

Southern logging association. Proceedings of the 3d annual meeting, 1913. 76 p. New Orleans, 1913.

Wood using industries

Lewis, R. G., comp. Wood-using industries of Ontario. 327 p. Ottawa, 1913. (Canada—Dept. of the interior—Forestry branch. Bulletin 36.)

Maxwell, Hu. Wood-using industries of Florida. 85 p. Tallahassee, Fla., Dept. of agriculture, 1913.

Maxwell, Hu. and Harris, John T. The wood-using industries of Iowa. 68 p. il. Ames, Ia., 1913. (Iowa—Agricultural experiment station. Bulletin 142.)

Maxwell, Hu. and Harris, John T. Wood-using industries of Minnesota, by Hu Maxwell and John T. Harris; Timber resources of Minnesota, by Wm. T. Cox. 87 p. il. St. Paul, Minnesota state forestry board, 1913.

White, Hall B. Woodworking exercises for the agricultural school shop. 39 p. il. St. Paul, 1913. (Minnesota—Agricultural experiment station. Bulletin 135.)

Auxiliary Subjects*Conservation of natural resources*

Canada—Commission of conservation. Report of the fourth annual meeting, held at Ottawa, Jan. 21-22, 1913. 238 p. pl. Toronto, 1913.

Wisconsin—Conservation commission. Third biennial report. 76 p. map. Madison, Wis., 1912.

National parks and monuments

Fewkes, Jesse Walter. Casa Grande, Ariz. 179 p. il., pl. Wash., D. C., 1913.

Mesa Verde national park. Report of the superintendent, 1913. 18 p. Wash., D. C., Govt. printing office, 1913.

United States—National park conference. Proceedings of the national park conference held at the Yosemite national park, Oct. 14, 15 and 16, 1912. 145 p. Wash., D. C., Govt. printing office, 1913.

Range management

Sampson, Arthur W. The reseeding of depleted grazing lands to cultivated forage plants. 43 p. il., pl. Wash., D. C., 1913. (U. S.—Dept. of agriculture. Bulletin 4.)

Periodical Articles*Miscellaneous periodicals*

American boy, Nov., 1913.—Forestry as a profession, by Filibert Roth, p. 6-7, 22.

American City, Sept., 1913.—Reforestation and general care of watersheds, by E. M. Peck, p. 246-8.

Conservation, Oct., 1913.—Beetles ravage Oregon forests, p. 2; Recommendations of forester re brush disposal, by Clyde Leavitt, p. 2.

Country gentleman, Sept. 27, 1913.—Improving the sugar orchard, by Samuel J. Record, p. 1420-1.

Country gentleman, Oct. 18, 1913.—Conquering the stumps; where farming begins with the ax and the brush-hook, by Chas. E. Gapen, p. 1523-4; By-products of the forest; thousands of cords of wood are made into charcoal every year, by Dwight Carter, p. 1525.

Country life in America, Nov., 1913.—The vanishing elms of New England, by Bradford Burnham, p. 59-60, 76, 78.

Field and stream, Nov., 1913.—Hunting in the national forests, by Bristow Adams, p. 722-3.

Forest and stream, Oct. 25, 1913.—Russian forests; increase of prices for timber, p. 521-2.

Geographical journal of the Royal geographical society, London, Oct., 1913.—The United States national parks, by H. O. Beckit, p. 333-42; Impressions of the vegetation in the United States of America, by Alan G. Ogilvie, p. 342-60.

Journal of the Franklin institute, Nov., 1913.—The chemistry of humus, with special reference to the relation of humus to the soil and to the plant, by S. L. Jodili, p. 565-73.

Popular science monthly, Nov., 1913.—The petrified forest of Mississippi, by Calvin S. Brown, p. 466-70.

Science, Aug 8, 1913.—Branch movements induced by changes of temperature, by J. G. Grossenbacher, p. 201-5.

Scientific American, Oct. 4, 1913.—The circulation of sap in trees; the factors causing movements of sap are not yet admitted by all botanists, p. 221; How trees are converted into paper, by T. J. Keenan, p. 256-8.

Scientific American supplement, Oct 4, 1913.—The octopus of the spruce forest; an equipment that every minute devours one log a foot in diameter and ten feet long, by W. H. Kempfer, p. 216-17.

Suburban life, Nov., 1913.—Uncle Sam's pure water bureau; forest rangers protect from contamination streams that furnish cities with water, by Shirley Buck, p. 255.

United States—Dept. of agriculture. *Journal of agricultural research*, Nov. 1913.—Three undescribed heart-rots of hardwood trees, especially of oak, by W. H. Long, p. 109-28.

Westminster review, Sept., 1913.—Plan for afforestation in the United Kingdom, by F. W. Tugman, p. 258-62.

Trade journals and consular reports

American lumberman, Oct. 11, 1913.—Foresters of the future in the making, by C. A. Lagerstrom, p. 52-3.

American lumberman, Oct. 25, 1913.—A visit to the Temagami forest reserve, p. 49; Experiments in treating Douglas fir ties, p. 52.

American lumberman, Nov. 1, 1913.—Service tests of wood block paving, by Howard F. Weiss, p. 28; Locating fires on the national forests, by Bristow Adams, p. 30-1; Lumber: its uses and abuses, by Julius Seidel, p. 50-2; Why some wood will not burn, p. 60.

American lumberman, Nov. 8, 1913.—Manufacture of excelsior, p. 45; Conservation show a success, p. 50.

Hardwood record, Oct. 25, 1913.—Hardwood paving blocks, p. 14; The Adirondack hardwoods, by Nelson C. Brown, p. 18-19; Drying plain and quartered oak, by J. C. T., p. 21; Insect enemies of seasoned oak, p. 28-9.

Hardwood record, Nov. 10, 1913.—Utilization at German sawmills, by Nelson C. Brown, p. 20-1; The exports of red gum, p. 24-5; The lacrosse-stick industry, p. 25; Fir wood distillation, p. 26-7; Sane forest fire protection, by J. S. Hickok, p. 27-9; Red gum, p. 31; Kiln-dried hardwoods, p. 34.

Lumber trade journal, Nov. 1, 1913.—Wood using industries of Alabama, as described by state forester, p. 47-8.

Lumber world review, Oct. 25, 1913.—Creosoted paving block history in the south, p. 26-8.

Paper, Oct. 29, 1913.—Evaluation of pulpwood, by Martin L. Griffin, p. 15-17; Stanley wood digester, a new invention, p. 22-3; New soda process for wood, p. 23.

Paper, Nov. 5, 1913.—Brown woodpulp, p. 23; New uses for sawdust, p. 23.

Paper trade journal, Nov. 6, 1913.—Pulp and other products from waste resinous woods, p. 48; Early use of wood in the manufacture of paper, p. 54.

Pioneer western lumberman, Oct. 15, 1913.—Tiny trees of Japan, p. 19; Muir woods on Mt. Tamalpais, Marin Co., Cal., p. 19; Hardwood of the Philippines, p. 21.

Pulp and paper magazine, Oct. 1, 1913.—The forest products laboratory and its work, by R. B. Owen, p. 658-61.

St. Louis lumberman, Oct. 15, 1913.—Forest products in paper-making, p. 32; The retail lumberman and the silo business, by J. F. Goodman, p. 60-2; Ozark cedar in the pencil industry, p. 70.

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- St. Louis lumberman, Nov. 1, 1913.—Timber bonds, by Clark L. Poole, p. 69; A lumber sermon, by J. B. White, p. 49-50; Conservation of the natural resources of the nation, by Henry Sturgis Drinker, p. 71-2.
- Southern lumberman, Oct. 25, 1913.—Soft maple and hard maple; possibilities of the former as a furniture wood, p. 23-4.
- Southern lumberman, Nov. 1, 1913.—Effect of time of cutting on properties of wood, by Samuel J. Record, p. 24-5.
- Timber trade journal, Nov. 1, 1913.—An island forest in Russia, p. 692.
- Timberman, Oct., 1913.—Experience with a cable tramroad, by T. P. Jones, p. 29-32; A composite flying machine, by R. W. Vinnedge, p. 33-6; Operation of the new era cable system, by Wm. F. Izett, p. 36; How shall we teach logging engineering, by James O'Hearne, C. A. Schenck, and others, p. 38-46; European logging tramways of the Bleichert system, by Lewis T. Hays, p. 48-50; Horizontal donkey boiler; its advantages, by Fred McCurdy, p. 50-1; The model logging camp, by B. R. Lewis, p. 51; Air brake equipment in logging service, by H. J. Robinson, p. 51-3; Development of electric logging machinery, by E. F. Whitney, p. 56-8; The logger's fire box, by J. Chris O'Day, p. 58-60; Changing market conditions in lumber industry, by Thorpe Babcock, p. 61; Trials and needs of the logger in Montana, by George F. Weisel, p. 73-4; Proposed plan for steep hillside logging, by H. W. Sessoms, p. 74-5; Comparative fuel costs; wood, coal and oil, by H. W. Sessoms, p. 74-6; Incline railway of Yosemite lumber company, by G. H. Nickerson, p. 79-81.
- United States daily consular report, Oct. 23, 1913.—Eucalyptus growing in the United States, p. 429.
- United States daily consular report, Oct. 31, 1913.—Camphor industry in Japan, by Harold C. Huggins, p. 575.
- United States daily consular report, Nov. 10, 1913.—The cork industry of Spain, by Charles S. Winans, p. 747.
- West Coast lumberman, Nov. 1, 1913.—Aerial skidding not an experiment; Lidgerwood invention 27 years old, p. 27; A device for yarding logs through the air, which with a back rigging system enables economical operations over a distance of 2,000 feet at one sitting, p. 36-7.
- Wood craft, Nov., 1913.—The bureau bookcase; its design and construction, by John Bovingdon, p. 31-6; Insect-ridden timber and the lumber defects, by George E. Walsh, p. 36-7; Process employed in the finishing of furniture, by Rowley, p. 50-1; Practical points in selecting face
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veneer, by T. Morgan, p. 54-5; Preservation of wooden water pipe, p. 56.

Wooden and willow ware trade review, Oct. 9, 1913.—Dutch wood products; baskets, etc., by A. C. Nelson, p. 17-18.

Wood-worker, Oct., 1913.—To market the sawdust, by R. Neubecker, p. 26-7; Methods of piping drykilns, by D. R. Rye, p. 41-2.

Forest journals

Bulletin de la Société centrale forestière de Belgique, Oct., 1913.—Statistique des bois soumis au régime forestier, p. 635-44; Plantations en général; age des plants, by C. J. Q., p. 682-6; Republic française; lois forestières, p. 690-4; La chute des feuilles; comment et pourquoi se produit-elle?, p. 696-9.

Canadian forestry journal, Oct., 1913.—British Columbia forest work; bird's eye view of conditions in the Pacific province, by H. R. MacMillan, p. 155-6.

Centralblatt für das gesamte forstwesen, Aug.-Sept., 1913.—Die Schiffel-Glaser-sche forstliche rentabilitätslehre in ihrer anwendung auf den jährlich-nachhaltigen betrieb, by K. Egger, p. 365-98; Beobachtungen über borkenkäfer, by Kurt Loops, p. 405-14.

Forest leaves, Oct., 1913.—Pennsylvania forestry legislation, p. 66-9.

North woods, Oct., 1913.—National forests as recreation grounds, by Henry S. Graves, p. 20-2.

Revue des eaux et forêts, Sept. 1, 1913.—La correction des avalanches dans les Grisons, by P. Mougin, p. 513-32; Le bois de quebracho, p. 538-9; La forêt de Saint-Palais, by Paul Buffault, p. 577-92.

Schweizerische zeitschrift für forstwesen, Sept., 1913.—Die betriebsordnung im plenterwald, by R. Balsinger, p. 265-72; Die faktor steuern in der waldwertberechnung, p. 272-4.

Yale forest school news, Oct. 1, 1913.—The manufacture of excelsior, by Walter K. Wildes, p. 43.

Zeitschrift für forst- und jagdwesen, Sept., 1913.—Welchen einfluss hat ein zu tiefer stand der kiefer auf deren lebensdauer und ertrag, by Geist, p. 589-96; Zur forstarbeiterfrage, by N. Hoffmann, p. 596-602; Untersuchungen über den wachstumsgang normaler kiefernbestände im gouvernement Archangelsk, by A. Tjurin, p. 604-7.

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